Haier SERVICE MANUAL

Order No.AC0909S007V0

ON/OFF EK-Series

Model No.H2SM-(9+9)HEK03/R2

⚠WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death

©2009 (Qingdao Haier Air Conditioner General corp.,Ltd)
All right reserved .Unauthorized copying and distribution is a violation of law

Haier Group

Table of Contents

1. Introduction 1
1.1 Safety Cautions 1
1.2 Caution in Repair 1
1.3 Cautions Regarding Products after Repair 2
1.4 Inspection after Repair 4
1.5 Using Icons 5
1.6 Using Icons List 5
2. List of Functions 6
3. Specifications 7
4. Printed Circuit Board Connector Wiring Diagram 9
4.1 Indoor unit Connectors 9
4.2 Outdoor unit Connectors 10
5. Funcitions and Control 11
5.1 Main functions and control specification of indoor unit 11
5.2 Main functions and control specification of outdoor unit 14
5.3 Function of Main Thermistor 19
5.4 Thermistor resistance chart 20
6. System Configuration 29
6.1 System Configuration 29
6.2 Instruction 29
7 Service Diagnosis 48
7.1 Caution for Diagnosis 48
7.2 Problem Symptoms and Measures 48
7.3 Error Codes and Description 48
7.4. Trouble Shooting 49
8 Installation 57
9. Removal Procedure 65
9.1 The removal procedure of Indoor Unit 65
9.2 The removal procedure of Outdoor Unit 75
10. Appendix 89
10.1 Piping Diagrams 89
10.2 Wiring Diagrams 90
10.3 Circuit Diagrams 91
10.4 Description of coding rules of the unit model 93

1. Introduction

1.1 Safety Cautions

Be sure to read the following safety cautions before conducting repair work.

The caution items are classified into “Warning” and “Caution”. The “Warning” items are especially important since they can lead to death or serious injury if they are not followed closely. The “Caution” items can also lead to serious accidents under some conditions if they are not followed. Therefore, be sure to observe all the safety caution items described below.

About the pictograms

△ This symbol indicates an item for which caution must be exercised.
The pictogram shows the item to which attention must be paid.

○ This symbol indicates a prohibited action.
The prohibited item or action is shown inside or near the symbol.

● This symbol indicates an action that must be taken, or an instruction.
The instruction is shown inside or near the symbol.

After the repair work is complete, be sure to conduct a test operation to ensure that the equipment operates normally, and explain the cautions for operating the product to the customer.

1.2 Caution in Repair

Warning	
Be sure to disconnect the power cable plug from the plug socket before disassembling the equipment for a repair. Working on the equipment that is connected to a power supply can cause an electrical shook. If it is necessary to supply power to the equipment to conduct the repair or inspecting the circuits, do not touch any electrically charged sections of the equipment.	
If the refrigerant gas discharges during the repair work, do not touch the discharging refrigerant gas.The refrigerant gas can cause frostbite.	
When disconnecting the suction or discharge pipe of the compressor at the welded section, release the refrigerant gas completely at a well-ventilated place first. If there is a gas remaining inside the compressor, the refrigerant gas or refrigerating machine oil discharges when the pipe is disconnected, and it can cause injury.	
If the refrigerant gas leaks during the repair work, ventilate the area. The refrigerant gas can generate toxic gases when it contacts flames.	
The step-up capacitor supplies high-voltage electricity to the electrical components of the outdoor unit. Be sure to discharge the capacitor completely before conducting repair work.A charged capacitor can cause an electrical shock.	
Do not start or stop the air conditioner operation by plugging or unplugging the power cable plug. Plugging or unplugging the power cable plug to operate the equipment can cause an electrical shock or fire.	

Warning	
Do not repair the electrical components with wet hands. Working on the equipment with wet hands can cause an electrical shock.	
Do not clean the air conditioner by splashing water. Washing the unit with water can cause an electrical shock.	
Be sure to provide the grounding when repairing the equipment in a humid or wet place, to avoid electrical shocks.	
Be sure to turn off the power switch and unplug the power cable when cleaning the equipment. Theinternal fan rotates at a high speed, and cause injury.	
Do not tilt the unit when removing it. The water inside the unit can spill and wet the furniture and floor.	
Be sure to check that the refrigerating cycle section has cooled down sufficiently before conducting repair work. Working on the unit when the refrigerating cycle section is hot can cause burns.	
Use the welder in a well-ventilated place. Using the welder in an enclosed room can cause oxygen deficiency.	

1.3 Cautions Regarding Products after Repair

Warning	
Be sure to use parts listed in the service parts list of the applicable model and appropriate tools to conduct repair work. Never attempt to modify the equipment. The use of inappropriate parts or tools can cause an electrical shock, excessive heat generation or fire.	
When relocating the equipment, make sure that the new installation site has sufficient strength to withstand the weight of the equipment. If the installation site does not have sufficient strength and if the installation work is not conducted securely, the equipment can fall and cause injury.	
Be sure to install the product correctly by using the provided standard installation frame. Incorrect use of the installation frame and improper installation can cause the equipment to fall, resulting in injury.	For integral units only
Be sure to install the product securely in the installation frame mounted on a window frame. If the unit is not securely mounted, it can fall and cause injury.	For integral units only

Warning	
Be sure to use an exclusive power circuit for the equipment, and follow the technical standards related to the electrical equipment, the internal wiring regulations and the instruction manual for installation when conducting electrical work. Insufficient power circuit capacity and improper electrical work can cause an electrical shock or fire.	
Be sure to use the specified cable to connect between the indoor and outdoor units. Make the connections securely and route the cable properly so that there is no force pulling the cable at the connection terminals. Improper connections can cause excessive heat generation or fire.	
When connecting the cable between the indoor and outdoor units, make sure that the terminal cover does not lift off or dismount because of the cable. If the cover is not mounted properly, the terminal connection section can cause an electrical shock, excessive heat generation or fire.	
Do not damage or modify the power cable. Damaged or modified power cable can cause an electrical shock or fire. Placing heavy items on the power cable, and heating or pulling the power cable can damage the cable.	
Do not mix air or gas other than the specified refrigerant (R-410A/R22) in the refrigerant system. If air enters the refrigerating system, an excessively high pressure results, causing equipment damage and injury.	
If the refrigerant gas leaks, be sure to locate the leak and repair it before charging the refrigerant. After charging refrigerant, make sure that there is no refrigerant leak. If the leak cannot be located and the repair work must be stopped, be sure to perform pump-down and close the service valve, to prevent the refrigerant gas from leaking into the room. The refrigerant gas itself is harmless, but it can generate toxic gases when it contacts flames, such as fan and other heaters, stoves and ranges.	
When replacing the coin battery in the remote controller, be sure to disposed of the old battery to prevent children from swallowing it. If a child swallows the coin battery, see a doctor immediately.	

Caution	
Installation of a leakage breaker is necessary in some cases depending on the conditions of the installation site, to prevent electrical shocks.	
Do not install the equipment in a place where there is a possibility of combustible gas leaks. If a combustible gas leaks and remains around the unit, it can cause a fire.	
Be sure to install the packing and seal on the installation frame properly. If the packing and seal are not installed properly, water can enter the room and wet the furniture and floor.	For integral units only

1.4 Inspection after Repair

Warning	
Check to make sure that the power cable plug is not dirty or loose, then insert the plug into a power outlet all the way. If the plug has dust or loose connection, it can cause an electrical shock or fire.	
If the power cable and lead wires have scratches or deteriorated, be sure to replace them. Damaged cable and wires can cause an electrical shock, excessive heat generation or fire.	
Do not use a joined power cable or extension cable, or share the same power outlet with other electrical appliances, since it can cause an electrical shock, excessive heat generation or fire.	

Caution	
Check to see if the parts and wires are mounted and connected properly, and if the connections at the soldered or crimped terminals are secure. Improper installation and connections can cause excessive heat generation, fire or an electrical shock.	
If the installation platform or frame has corroded, replace it. Corroded installation platform or frame can cause the unit to fall, resulting in injury.	
Check the grounding, and repair it if the equipment is not properly grounded. Improper grounding can cause an electrical shock.	
Be sure to measure the insulation resistance after the repair, and make sure that the resistance is 1 M ohm or higher. Faulty insulation can cause an electrical shock.	
Be sure to check the drainage of the indoor unit after the repair. Faulty drainage can cause the water to enter the room and wet the furniture and floor.	

1.5 Using Icons

Icons are used to attract the attention of the reader to specific information. The meaning of each icon is described in the table below:

1.6 Using Icons List

Icon	Type of Information	Description
Note	Note	A “note” provides information that is not indispensable, but may nevertheless be valuable to the reader, such as tips and tricks.
Caution	Caution	A “caution” is used when there is danger that the reader, through incorrect manipulation, may damage equipment, loose data, get an unexpected result or has to restart (part of) a procedure.
Warning	Warning	A “warning” is used when there is danger of personal injury.
	Reference	A “reference” guides the reader to other places in this binder or in this manual, where he/she will find additional information on a specific topic.

2. List of Functions

Category	Functions	H2SM-(9+12)HEK03/R2)
Healthy negative ion	make your room full of an abundance natural negative ions.	N
Child lock	Avoid the child's wrong operation on the remote controller	Y
Dry function	Make dehumiditying in the room when the unit is working in the "DRY" mode.	Y
24Hour timer	Use the timer function to set on,or off,or from on to off,or from off to on	Y
Auto restart	automatic return to previous operation conditions after asundden power blackout	Y
Easy clean design	The panel is easy to wash and the airflow vents can be detached easily	Y
Intelligent air	With twin-blade technology ,the airflow can be adjusted not to blow directly	Y
Anti-mold filter	Catches most small particles and remove unpleasant odors effectively.	Y
Sleep mode	The setting temprature and the indoor noise can be adjusted to a more comfortable level when you set the "sleep mode"during night sleep	Y
4 Fan setting	Slect the fan speed LO,MED,HI,AUTO	Y
Auto mode	adjust the last fixed operation mode automatically.	Y
Power mode	Quick cooling or heating	N
Soft mode	lower noise operation condition	N
Negative ion filter	Generate negative ions by the filter.	N
Constant temperature dehumidification	Make dehumidifying in the room while keeping the constant temperature inside	N

Note: Y : Holding Functions
N : No Functions

3. Specifications

Model			H2SM-(9+9)HEK03/R2	
			Cooling(single/doubl)	Heating(single/double)
Capacity Rated(Min.~Max.)		kW	2.65/5.3	2.9/5.8
		Btu/h	9050//18100	9897/19800
		kcal/h	2280/4560	2494/4990
Mositure Removal		L/h	1.2/2.4	—
Running Current(Read)		A	3.9/7.8	3.8/7.6
Power Consumption Read(Min.~Max.)		W	880/1760	850/1700
Power Factor		%	97	97
COP Rated (Min.~Max.)		W/W	3.01/3.01	3.41/3.41
Piping Connctions	Liquid	mm	Φ6.35	
	Gas	mm	Φ9.52	
	Drain	mm	Φ16.0	
Heat Insulation			Both Liquid and Gas Pipes	
Max. Interunit Piping Length		m	15	
Max. Interunit Height Difference		m	10	
Chargeless		m	5	
Amount of Additional Charge of Refrigerant		g/m	20	
Indoor Unit				
Front Panel Color			White	
Air Flow Rate	m^3/min(cfm)		Single	
		H	7.5	
		M	6.5	
		L	5.5	
Fan	Type		Cross Flow Fan	
	Motor Output	W	20	
	Speed	Steps	3 Steps and Auto	
Air Direction Control			Right / Left / Horizontal / Downward	
Air Filter			Removable / Washable / Mildew Proof	
Running Current (Rated)		A	0.13	
Power Consumption (Rated)		W	29	
Power Factor		%	97	
Temperature Control			Microcomputer Control	
Dimensions (H×W×D)		mm	265×795×187	
Packaged Dimensions (H×W×D)		mm	360×871×304	
Weight		kg	8.8	
Gross Weight		kg	11.3	
Operation Sound	H/M/L	dBA	38/33/31	
Sound Power	H	dBA	54	

Outdoor Unit				
Casing Color				Ivory White
Compressor	Type			Rotary compressor
	Model			44A203A(B)/PA118X1C-4FZ(A)
	Motor Output		W	850(B)/970(A)
	Oil Type			NMOCZE-Gles RB68EP(B)/ ESTER OIL VG74(A)
	Oil Charge		L	270(B)/350(A)
Refrigerant	Model			R410A
	Charge		kg	0.85(B)+1.15(A)
Air Flow Rate (cooling/ kHeating)	m^3/min(High)			31.3
	m^3/min(Low)			20.5
	cfm(High)			1104
	cfm(Low)			723
Fan	Type			Propeller fan
	Motor Output		W	35
Running Current				single/double
	Norminal	Cooling	A	3.9/7.8
		Heating	A	3.8/7.6
	Maximum	Cooling	A	5.3/11.1
		Heating	A	5.9/11.3
Starting current		Cooling	A	21.5/-
		Heating	A	21.5/-
Dimensions (H×W×D)(stop valve, and bottom support is not included)			mm	820×682×310
Packaged Dimensions (H×W×D)			mm	949×745×406
Weight			kg	56
Gross Weight			kg	60
Operation Sound	H/L		dBA	54
Sound Power	H/L		dBA	

Note: The data are based the conditions shown in the table below.

Cooling	Heating	Piping Length
Indoor: 27°CDB/19°CDB Outdoor: 27°CDB/19°CDB	Indoor: 20°CDB Outdoor: 7°CDB/6°CDB	5m

Conversion Formulae
kcal/h=kW×860
Btu/h=kW×3414
cfm=m^3/min×35.3**ext**

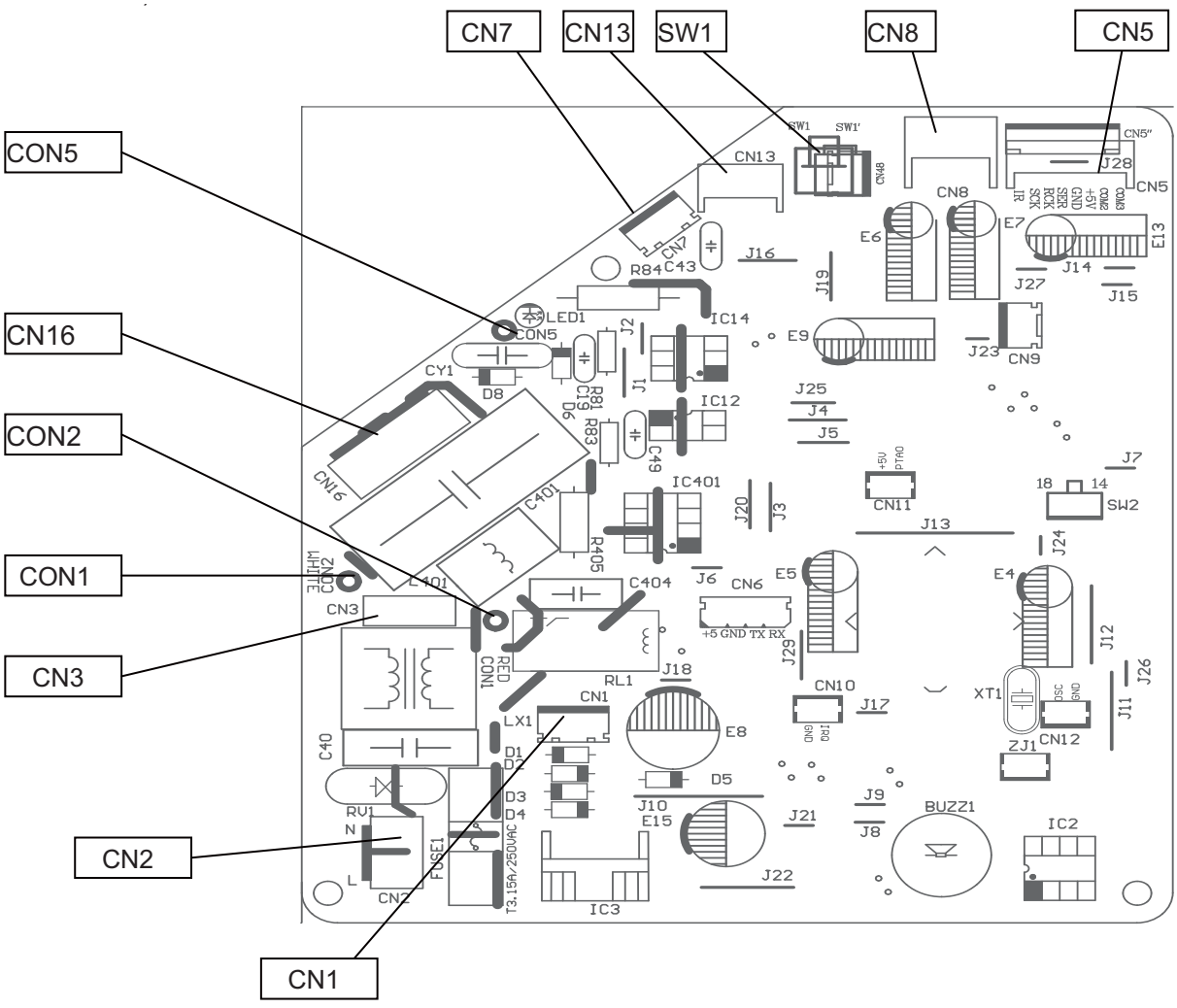
4. Printed Circuit Board Connector Wiring Diagram

4.1 Indoor unit Connectors

Connectors

PCB (Control PCB)

1) CN1 connector for transformer output
2) CN2 connector for power L,N wire
3) CN3 connector for transformer input
4) CN5 connector for display board
5) CN7 connector for AC fan motor feedback
6) CN8 connector for Pipe sensor and Room temperature sensor
7) CN13 connector for up and down step motor
8) CN16 connector for AC fan motor
9) CON5 connector for linking cable between the indoor and outdoor
10) CON1, CON2 connector for ions generator(reserved).
11) SW1 connector for ON / OFF switch

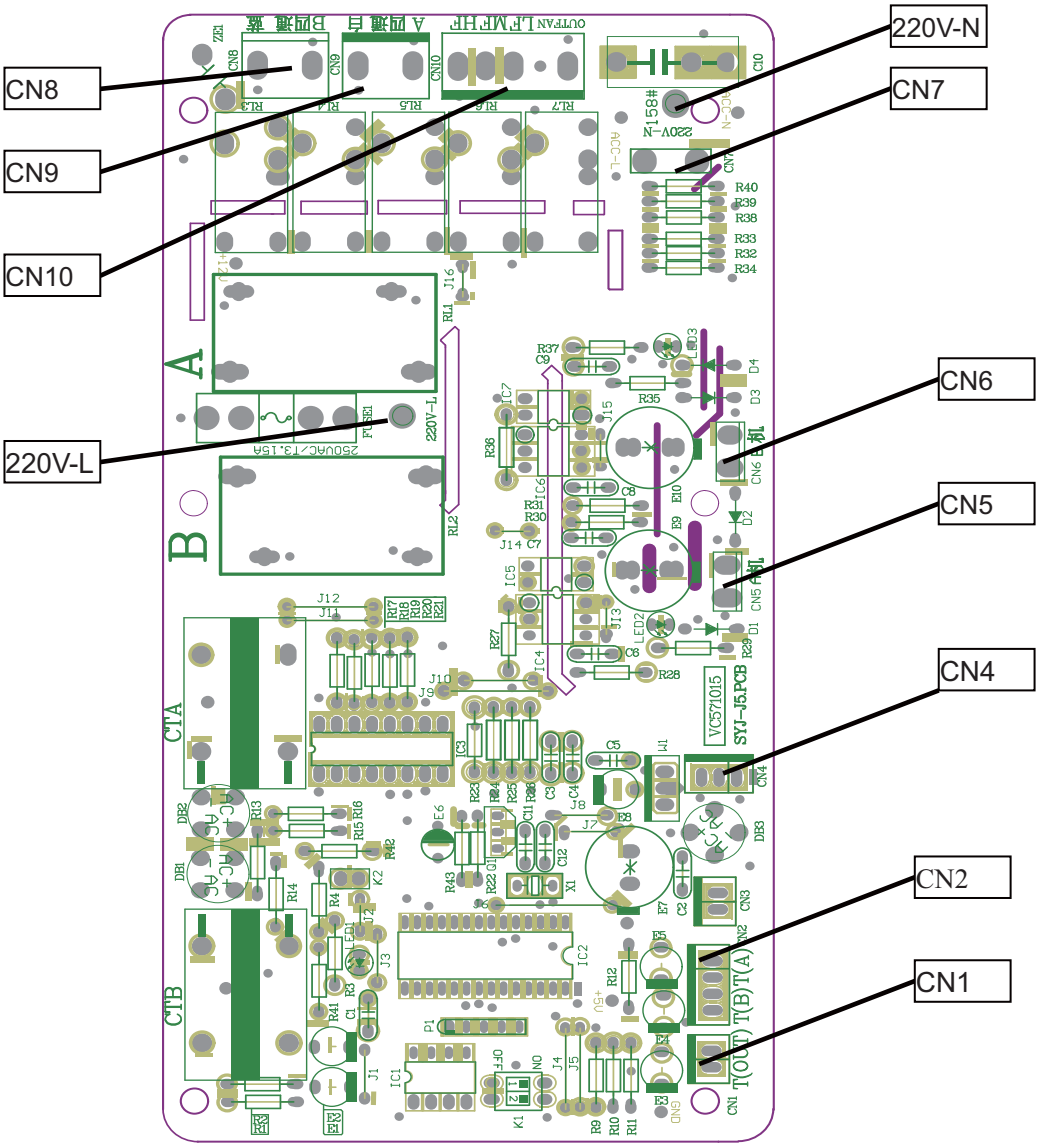


4.2 Outdoor unit Connectors

Connectors

PCB (Control PCB)

1) CN1 connector for outdoor temperature sensor
2) CN2 connector for outdoor pipe temperature sensor
3) CN4 connector for transformer output
4) CN5 connector for communicate wire of A unit
5) CN6 connector for communicate wire of B unit
6) CN7 connector for transformer input
7) CN8 Connector for four way valve coil of B unit
8) CN9 Connector for four way valve coil of A unit
9) CN10 Connector for out fan motor
10) 220V-N connector for N power wiring
11) 220V-L connector for L power wiring



5. Funcitions and Control

5.1 Main functions and control specification of indoor unit

Note: See the list of functions for the functions applicable to different models.

5.1.1 Automatic running

When the running mode is turned to automation after starting the system, the system will first determine the running mode according to the current room temperature and then will run according to the determined mode. Tr in the following selection conditions means room temperature, Ts means setting temperature, Tp means temperature of indoor coil pipe

Tr≥23°C Choose the cooling mode

Tr<23°C Choose the warming mode

After turning to the automation mode, the running mode can be switched between cooling mode, fan mode and heating mode according to the change of the indoor ambient temperature. But the automatic conversion between cooling mode and heating mode must be conducted after 15 minutes.

5.1.2 Indoor temperature control

Temperature control range: 16°C---30°C

Temperature difference: ±1°C

Compressor can't be controlled by temperature sensor within 2 minutes after it starts

1.Cooling mode:

When Tr> Ts, outdoor fan motor and compressor on, and indoor fan motor run at fixed wind speed.

When Tr< Ts, outdoor fan motor and compressor off, and when Tr > Ts, outdoor fan motor and compressor are working again .If Tr=Ts, the indoor fan motor , outdoor fan motor and the compressor's state will not change.

2.Heating mode:

When Tr ≤ Ts, compressor, four-ways valve and outdoor fan motor is on, indoor fan motor runs as in cold blast avoidance mode, and 4°Cof compensation is added after compressor is started.

When Tr>Ts+5°C, compressor is off, and the indoor fan motor runs as in cold blast avoidance mode.

When Tr<Ts+5°C, compressor, four-ways valve and outdoor fan motor is on, and the indoor fan motor runs as in the mode of avoiding cold blast.

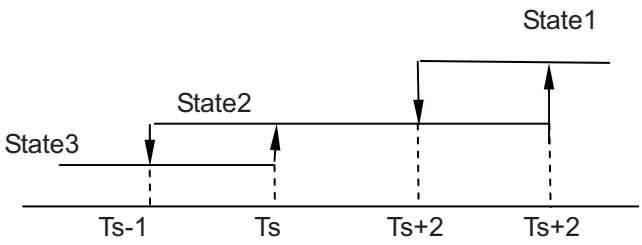
5.1.3 Dehumidification mode

The compressor, outdoor fan and indoor fan will run as per the following working pattern so as to realize the refrigerating running of dehumidification:

1) Tr> Ts+2°C, compressor, outdoor fan run continuously, indoor fan runs as per setting wind speed (State 1);

2) Ts+2°C≥Tr≥Ts, compressor, outdoor fan run intermittently with 10 minutes ON, 6 minutes OFF. (Compressor and outdoor fan are synchronous) indoor fan runs in fixed lower wind speed, and will cease at the stand-by time of 3 minutes (State 2)

3) Tr <Ts, compressor, outdoor fan ceases, indoor fan runs in lower wind speed. (State 3)



5.1.4 Indoor Fan Control

5.1.4.1 Cooling run mode:

auto: when Tr≥Ts+3°C , the wind speed is high;

When Ts+1°C≤ Tr <Ts+3 , the wind speed is medium.

When Tr Ts+1 , the wind speed is low.

When temperature sensor is off, the fan motor runs at low speed.

When the wind speed changes from low to high, there is no delay, and when it changes from high to low, there is a 3-minutes delay before conversion.

Manual operation:When unit is on the wind speed can be set to high, medium, low or automatic as required (execute instruction 2 seconds later after receiving remote signal)

5.1.4.2 Heating run mode:

Manual operation: The wind speed can be set to high, medium, low or automatic as required.

Automatic operation: When Tr<Ts, the wind speed is high;

When Ts≤Tr<Ts+2°C , the wind speed is medium.

When Ts+2°C≤ Tr, the wind speed is low.

5.1.4.3 Warm start:

When heating running begins, indoor fan will conduct the following fan control:

If the temperature of indoor coil pipe is ≥23°C , start lower wind speed;

If the temperature of indoor coil pipe is ≥38°C , turn to setting wind speed.

5.1.4.4 Control of indoor fan under heating OFF state

Under heating state, the compressor will cease; if the indoor coil pipe's temperature Tp≥23°C , indoor fan will run in lower wind speed ; if the coil pipe's temperature Tp<21°C ,indoor fan will cease.

5.1.5 3minutes stand-by time

When the compressor ceases due to the sensor OFF, unit On or OFF or fault, it will maintain pause for 3 minutes.

5.1.6 Compensatory function of power failure

If the unit is suddenly off during running due to power failure, or closed for maintenance or troubleshooting, it will restart to run after the power resumes with the original condition before the unit is off.

Note:

1. Function setting: Pressing the SLEEP button on the remote control unit for 10 times until hearing 4 sounds from the buzzer on the panel.
2. Memory content: Running mode, setting wind speed, setting temperature, sleep state, flap state.

3. Cancellation of function: Pressing the SLEEP button on the remote.
   Control unit for 10 times until hearing 2 sounds from the buzzer on the panel.

5.1.7 Air refreshing

Up reception of remote control signal, negative ion generator will start operation to emit negative ion if fan is operating.

If fan stops, negative ion generator is off.

When negative ion generator is off, if air-refreshing feature is set and fan restarts then negative ion generator is on.

5.1.8 Timer Operation

You can set 24-hour timer on or timer off as required, and the minimum time unit is 1 minute. After setting, a pattern of clock displayed on the LED, and it is off when timer setting is completed. There are several timer mode as follows.

1).Timer on: The pattern of clock displaied on the LED,the background light is off, and unit behaves with halt status. Timer on is completed, and then unit starts running with the pattern of clock disappeared,and the background light is on. The unit starts with the last setting receiving timer signals, and sleep setting is not allowed.

2).Timer off: Unit working, the pattern of clock displaied on the LED; When reaching time setting, unit enters shutdown mode, and sleep function can be set. If timer off and sleep are set synchronously, the one which time is short run first. Executing shutdown instruction clear timer and sleep function.

3).Timer on and timer off can be set synchronously.

Execution sequence is based on the setting.

5.1.9 Sleep Operation

When remote control set sleep mode, timer lamp is on.

In cooling/dehumidification mode, set temperature will rise 1°C after 1 hour operation and another 1°C after the second hour. The unit will stop after another 6 hours.

In heating mode, set temperature will fall 2°Cafter 1 hour and another 2 °Cafter the second hour and will rise 1°C after another 3 hours and the unit will stop after another 3 hours.

If airflow of indoor fan is high before setting sleep mode, then it will turn into mid level after sleep mode is set.

If airflow of indoor fan is mid before setting, it will turn into low level after setting. If airflow of indoor fan is low before setting, then it will not change after setting.

5.1.10 Emergency running mode

When the air conditioner is in stand-by state, press the emergency switch till hearing a sound from the buzzer, then the air conditioner will turn to the emergency run state. The rules of emergency run are as follows:

Tr≥23°C, running refrigerating mode, Ts = 26°C;

Tr<23°C, running heating mode, Ts = 23°C.

5.2 Main functions and control specification of outdoor unit

5.2.1 Single-unit cooling operation

When the single unit's indoor unit gives a cooling signal, the corresponding outdoor compressor carries out cooling operation. During the operation, the outdoor fan operates 1 second before the compressor operates.

When changed from heating to cooling, the compressor stands by for 3 minutes, the outdoor fan operates to blow off remaining heat and stops 30 seconds later.

When the outdoor ambient temperature T1≥38°C, the outdoor fan runs at the high speed. There is a return difference of 2°C for the change between high and medium speed.

When the outdoor ambient temperature T1≤26°C, the outdoor fan runs at the low speed. There is a return difference of 2°C for the change between low and medium speed.

When the outdoor ambient temperature T1≤8°C, the outdoor fan is in a cycle of 1 minute stop and 3 minute run. There is a return difference of 2°C for the change between low speed and run and stop.

Once the fan operates in a mode, it must operate for more than 45 seconds.

There is a temperature cut-off protection: when the indoor coil temperature higher than T_CPS (68°C) and maintains for 10 seconds, both the compressor and outdoor fan stop. The compressor will not restart in 3 minutes until the coil temperature lower than T_CP R(50°C). The indoor fan is controlled the same as the thermostat is OFF.

5.2.2 Double-unit cooling operation

When the indoor unit gives out a double unit cooling signal, outdoor compressor A starts cooling operation. During the operation, the outdoor fan runs 1 second before compressor A operates, 20 seconds later, outdoor compressor B starts cooling operation.

Once a compressor starts, the other compressor will not start in 20 seconds from the start.

When changed from heating to cooling, the compressor stands by for 3 minutes. When both compressors are in the strand-by status, the outdoor fan stops. Otherwise, it operates. The status of the fan depends on the number of the compressors that operate.

When the outdoor ambient temperature T1≥30°C, the outdoor fan runs at the high speed. There is a return difference for the change between high and medium speed;

When the outdoor ambient temperature T1≤23°C, the outdoor fan runs at the low speed. There is a return difference for the change between low and medium speed;

When the outdoor ambient temperature T1≤5°C, the outdoor fan is in a cycle of 1 minute stop and 3 minute run. There is a return difference of 2°C for the change between low speed and run and stop.

Once the fan operates in a mode, it must operate for more than 45 seconds.

There is a temperature cut-off protection: when a indoor coil temperature higher than T_CPS (68°C) and maintains for 10 seconds, the corresponding compressor stops. The compressor will not restart in 3 minutes until the coil temperature lower than T_CPR(50°C). The indoor fan is controlled the same as the thermostat is OFF.

In the case of double-unit cooling, one compressor stops and it changes to the single-unit operation. The fan is controlled in the single-unit operation mode. It stops 30 after blowing off the remaining heat only if both compressors turn off at the same time.

5.2.3 Single unit heating operation

When the single unit's indoor unit gives a heating signal, the corresponding outdoor compressor carries out cooling operation. During the operation, the outdoor fan and 4-way valve operate 1 second

before the outdoor fan operates.

When changed from cooling to heating, the compressor stands by for 3 minutes, the outdoor fan stops.

When the outdoor ambient temperature T1≤3°C, the outdoor fan runs at the high speed. There is a return difference of 2°C for the change between high and medium speed.

When the outdoor ambient temperature T1≥13°C, the outdoor fan runs at the low speed. There is a return difference of 2°C for the change between low and medium speed.

Once the fan operates in a mode, it must operate for more than 45 seconds.

There is a high temperature protection and a temperature cut-off protection.

High temperature protection: When the indoor coil temperature higher than T_OFS (56°C), the outdoor fan stops; when the coil temperature falls to T_OFR (52°C), the outdoor fan restarts. The outdoor fan stops for more than 45 seconds.

High temperature cut-off protection: When the indoor coil temperature higher than T_CPS (68°C) and maintains for 10 seconds, both the compressor and outdoor fan stop, and the indoor fan operates as the thermostat is Off. The compressor will not restart in 3 minutes until the coil temperature lower than T_CP R(50°C).

5.2.4 Double-unit heating operation

When the double-unit's indoor unit gives out a heating signal, outdoor compressor A starts heating operation. During the operation, outdoor compressor A and the 4-way valve operate 1 second before the fan starts, 20 seconds later, outdoor compressor B starts heating operation.

Once an outdoor compressor starts, the other compressor will not start in 20 seconds from the start.

When changed from cooling to heating, the compressor stands by for 3 minutes. When both compressors are in the strand-by status, the outdoor fan stops. Otherwise, it operates. The status of the fan depends on the number of the compressors that operate.

When the outdoor ambient temperature T1≤10°C, the outdoor fan runs at the high speed. There is a return difference for the change between high and medium speed;

When the outdoor ambient temperature T1≥20°C, the outdoor fan runs at the low speed. There is a return difference for the change between low and medium speed.

Once a fan operates in a mode, it must operate for more than 45 seconds.

5.2.5 Cooling and heating operations take place at the same time

When one of the indoor units gives out a cooling signal and another unit gives out a heating signal at the same time, the outdoor fan operates at the low speed.

When the indoor unit gives the value of coil temperature, the outdoor fan runs at the low speed if the heating outdoor unit judges high load.

When outdoor ambient temperature T1≥28°C, there is no heating operation.

When outdoor ambient temperature T1≤7°C, there is no cooling operation.

Once a compressor starts, the other compressor will not start in 20 seconds from the start.

5.2.6 Single-unit heating operation with heat load

In the single-unit heating operation, the indoor unit gives out the value of the coil temperature, and the outdoor unit judges whether to start in the high load protection operation based on the value of the coil temperature it has received. If the conditions for high load protection are met, the outdoor fan stops

immediately. It will restart 45 seconds later if the signal for the outdoor heat load disappears. Otherwise, the outdoor fan will continue to stop until the signal for the outdoor heat load disappears. The signal for heat load is as follows:

High temperature protection: When the indoor coil temperature higher than T_OFS (56°C), the outdoor fan stops; when the coil temperature falls to T_OFR (52°C), the outdoor fan restarts. The outdoor fan stops for more than 45 seconds.

High temperature cut-off protection: When the coil temperature higher than T_CPS (68°C) and maintains for 10 seconds, both the compressor and outdoor fan stop, and the indoor fan operates as the thermostat is Off. The compressor will not restart in 3 minutes until the coil temperature lower than T_CP R(50°C).

In the single-unit heating operation, the current in the compressor is larger than 5.8A, and the outdoor fan stops. 45 seconds later, the current in the compressor is less than 5.3A, and the outdoor fan operates in normal condition(the compressor does not detect current within 30 seconds after its start), the current in the compressor is larger than 5.3Aand less than 5.8A, and the outdoor fan does not restore.

5.2.7 Double-unit heating operation with heat load

In the double-unit heating operation, the indoor unit gives out the value of the coil temperature, and the outdoor unit judges whether to start in the high load protection operation based on the value of the temperature it has received. If the conditions for high load protection are met, the outdoor fan stops immediately. It will restart 45 seconds later if the signal for the outdoor heat load disappears.
Otherwise, the outdoor fan will continue to stop until the signal for the outdoor heat load disappears.
The signal for heat load is as follows:

High temperature protection: When the indoor coil temperature higher than T_OFS (56°C), the outdoor fan stops; when the coil temperature falls to T_OFR (52°C), the outdoor fan restarts. The outdoor fan stops for more than 45 seconds.

High temperature cut-off protection: When the coil temperature higher than T_CPS (68°C) and maintains for 10 seconds, both the compressor and outdoor fan stop, and the indoor fan operates as the thermostat is Off. The compressor will not restart in 3 minutes until the coil temperature lower than T_CP R(50°C).

When the outdoor single-unit gives out the heat load signal, the outdoor fan stops immediately, 45 minutes later, the heat load signal disappears, and the outdoor fan operates.

In heating operation, any of the current in the compressor is larger than or equal to 5.8A , and the outdoor fan stops. The current in the compressor is less than or equal to 5.3A, and the outdoor fan restores (the compressor does not detect current within 30 seconds after its start), the current in the compressor is larger than 5.3A and less than 5.8A, and the outdoor fan does not restore.

5.2.8 Current peak protection

The current in the compressor is larger than 10 After more than 5 seconds, The compressor which has the highest current will stop(the compressor does not detect current within 10 seconds after its start) and 3 minutes later it will continue to operate.

The compressor will no longer operate if overcurrent protection occurs 4 times in a row within 30 minutes, and the output transformer signal fails. In the double-unit operation, if one of the compressors stops due to the current too high, the other system is a single system.

5.2.9 Single-unit defrosting operation

5.2.9.1 Conditions for starting in the defrosting operation

The heating compressor starts and operate continuously for 10 minutes. After the compressor has been operating for 45 minutes in total (the defrosting operation ends, or when starting in the cooling mode, the compressor totals the operating time for zero clearance), detecting the defrosting sensor TE (detecting the frosting of the outdoor heat exchanger) and the outdoor ambient temperature sensor TA for straight 2 minutes, provided the following conditions are met, it will start for the defrosting operation: TE≤C×TA-α.

Where, TA<0°C, C=0.8; TA≥0°C, C=0.6.

α can be selected according to the data of EEPROM as follows:

Selection of Jumper	L	M	H
α(°C)	10	8	6

In the place where it tends to frost, it is preferred to choose H. In the place where it does not intend to frost, it is preferred to choose L. It is set M at delivery.

During the defrosting operation, the temperature control starts -15°C≤C×TA-α≤-2°C.

Note: If the result of the calculation from C×TA-α is less than -15°C , -15°C applies. If the result of the calculation from C×TA-α is larger than -2°C , -2°C applies.

5.2.9.2 Interval of defrosting

When the result of the calculation from C×TA-α falls in the range of -15°C≤C×TA-α , the interval between two defrosting operations is 45 minutes.

When the result of the calculation from C×TA-α falls in the range of C×TA-α<-15°C , the interval between two defrosting operations is 55 minutes.

5.2.9.3 Defrosting operation

At the beginning of defrosting, the compressor is halted for the first one minute, but the outdoor fan operates, 50 seconds later, the 4-way valve is OFF.

During the defrosting operation, such protections as the compressor's current protection are available. The compressor may be interrupted for its protection or due to a trouble, and restore after 3 minutes. If it remains in the defrosting period, it will still start to defrost. The start of the compressor is made by the rules for the start of the defrosting compressor. (if it cannot restore 3 times in a row, it will be dealt with as in trouble and cancel defrosting.)

5.2.9.4 Finish Defrosting operation

Once starting to defrostthe compressor must be guaranteed at least 2 minutes of operation before canceling defrosting. As for the conditions to cancel defrosting, it will restore to the heating operation from the defrosting operation as long as any of the following conditions is met.

- The outdoor heat exchanger temperature is above 7 degrees for consecutive 80 seconds.
- The outdoor heat exchanger temperature is above 5 degrees for consecutive 12 seconds.
- The defrosting operation has lasted 9 minutes.

After the conditions for cancellation of defrosting are met, the following operations will follow:

The compressor stops, the outdoor fan starts, 50 seconds later, the 4-way valve is engaged, and 60 seconds later, the compressor operates.

5.2.10 Double-unit defrosting operation

After receiving the signal to stop the indoor unit during the defrosting period, the unit must not be turned off until the outdoor defrosting lasts more than 2 minutes.

When the double units are activated for defrosting, the activation of compressor B is 20 minutes later than that of compressor A.

Conditions for ending defrosting: It will restore to the heating operation from the defrosting operation as long as any of the following conditions is met. The temperatures on both outdoor heat exchangers are above 7 degrees for consecutive 80 seconds.

The temperatures on both outdoor heat exchangers are above 5 degrees for consecutive 12 seconds.

The defrosting operation has lasted 9 minutes.

The starting conditions and control process for the double-unit are same as that for single-unit defrosting, the only difference is that the activation of compressor B lags that of compressor A.

5.2.11 Alarming operation

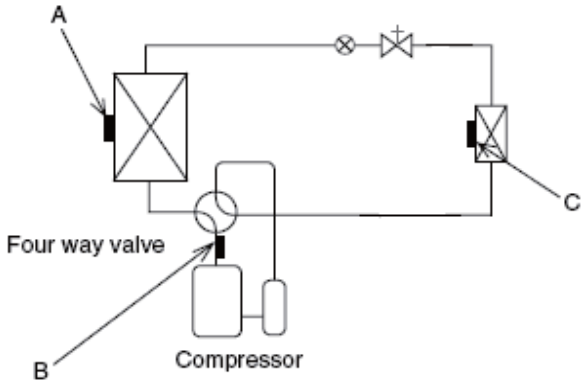
When the whole unit is in normal operation, the alarm light is always on, but does not flash.

When the outdoor temperature sensor short-circuited or disconnected, the outdoor fan always operates at the medium speed and will restore automatically after the sensor comes to normal.

When the temperature sensors on the pipes A and B short-circuited or disconnected, the double unit will not carry out defrosting operation. During heating, this signal is sent to the indoor unit, but no sending for other operating conditions. When sent to the indoor unit, the whole unit stops. The signal is sent to the indoor unit which coil is operating abnormally, and the corresponding indoor unit indicates trouble.

When the temperature sensor short-circuited or disconnected or the current transformer fails, the alarm light flashes in the following manner; when the current transformer fails, the signal is sent to the indoor unit that operates abnormally, and the corresponding indoor unit indicates trouble.

5.3 Function of Main Thermistor



Note: A:Outdoor suction temperature sensor
B: Exhaust temperature sensor
C: Indoor heat-exchange sensor

Outdoor Suction Temperature Sensor	The outdoor heat exchanger thermistor is used for controlling target discharge temperature. The system sets a target discharge temperature according to the outdoor and indoor heat exchanger temperature, and controls the electronic expansion valve opening so that the target discharge temperature can be obtained.
Exhaust Temperature Sensor	The discharge pipe thermistor is used for controlling temperature of the discharge pipe. If the temperature of discharge pipe (used in place of the inner temperature of the compressor) rises abnormally, the operating frequency drops or the operation halts.
Indoor heat-exchange Sensor	1.The indoor heat exchanger thermistor is used for controlling target discharge temperature. The system sets a target discharge temperature according to the outdoor and indoor heat exchanger temperature, and controls the electronic expansion valve opening so that the target discharge temperature can be obtained. 2.The indoor heat exchanger thermistor is used for preventing freezing.During the cooling operation, if the temperature drops abnormally, the operating frequency becomes lower, then the operation halts. 3.The indoor heat exchanger thermistor is used for anti-icing control.During the cooling operation, if the heat exchanger temperature in the room where operation is halted becomes -1°C, it is assumed as icing.

5.4 Thermistor resistance chart

5.4.1 Intdoor Unit

Room sensor

R25°C=23KΩ±3%

B25°C/50°C=4200K±3%

Temp.((°C))	Max.(KΩ)	Normal(KΩ)	Min.(KΩ)	Tolerance(°C)	
-30	568.8372	501.0746	440.8435	-1.97	1.75
-29	530.9600	468.6491	413.1441	-1.95	1.74
-28	495.8488	438.5314	387.3645	-1.93	1.72
-27	463.2850	410.5433	363.3602	-1.91	1.71
-26	433.0683	384.5212	340.9980	-1.90	1.70
-25	405.0156	360.3153	320.1558	-1.88	1.69
-24	378.9588	337.7879	300.7211	-1.86	1.67
-23	354.7440	316.8126	282.5905	-1.84	1.66
-22	332.2300	297.2732	265.6686	-1.82	1.64
-21	311.2873	279.0627	249.8676	-1.80	1.63
-20	291.7969	262.0831	235.1067	-1.78	1.62
-19	273.6494	246.2437	221.3111	-1.76	1.60
-18	256.7445	231.4612	208.4122	-1.74	1.59
-17	240.9897	217.6590	196.3462	-1.72	1.57
-16	226.3000	204.7662	185.0545	-1.70	1.56
-15	212.5973	192.7176	174.4829	-1.68	1.54
-14	199.8093	181.4531	164.5813	-1.66	1.53
-13	187.8698	170.9169	155.3033	-1.64	1.51
-12	176.7176	161.0578	146.6059	-1.62	1.49
-11	166.2961	151.8284	138.4495	-1.60	1.48
-10	156.5532	143.1847	130.7973	-1.58	1.46
-9	147.4409	135.0863	123.6153	-1.56	1.44
-8	138.9148	127.4956	116.8717	-1.53	1.43
-7	130.9337	120.3778	110.5374	-1.51	1.41
-6	123.4597	113.7009	104.5852	-1.49	1.39
-5	116.4577	107.4349	98.9897	-1.47	1.38
-4	109.8953	101.5523	93.7278	-1.45	1.36
-3	103.7422	96.0274	88.7774	-1.43	1.34
-2	97.9708	90.8365	84.1185	-1.40	1.32
-1	92.5551	85.9574	79.7322	-1.38	1.30
0	87.4712	81.3697	75.6011	-1.36	1.29
1	82.6970	77.0544	71.7088	-1.34	1.27
2	78.2118	72.9937	68.0402	-1.31	1.25
3	73.9966	69.1712	64.5813	-1.29	1.23
4	70.0335	65.5716	61.3188	-1.27	1.21
5	66.3062	62.1807	58.2405	-1.24	1.19
6	62.7992	58.9853	55.3351	-1.22	1.17
7	59.4984	55.9729	52.5917	-1.20	1.15
8	56.3905	53.1320	50.0006	-1.17	1.13
9	53.4631	50.4521	47.5523	-1.15	1.11
10	50.7048	47.9230	45.2384	-1.13	1.09
11	48.1049	45.5355	43.0505	-1.10	1.07
12	45.6534	43.2808	40.9813	-1.08	1.04
13	43.3410	41.1509	39.0236	-1.05	1.02
14	41.1592	39.1381	37.1708	-1.03	1.00
15	39.0998	37.2355	35.4167	-1.00	0.98

Temp.((°C))	Max.(KΩ)	Normal(KΩ)	Min.(KΩ)	Tolerance(°C)	
16	37.1553	35.4363	33.7555	-0.98	0.96
17	35.3186	33.7344	32.1818	-0.95	0.94
18	33.5833	32.1240	30.6905	-0.93	0.91
19	31.9432	30.5997	29.2769	-0.90	0.89
20	30.3925	29.1565	27.9365	-0.88	0.87
21	28.9259	27.7895	26.6651	-0.85	0.84
22	27.5383	26.4944	25.4589	-0.83	0.82
23	26.2252	25.2670	24.3140	-0.80	0.80
24	24.9822	24.1034	23.2271	-0.78	0.77
25	23.8050	23.0000	22.1950	-0.78	0.77
26	22.7500	21.9499	21.1520	-0.78	0.78
27	21.7477	20.9536	20.1638	-0.82	0.81
28	20.7951	20.0081	19.2272	-0.86	0.85
29	19.8895	19.1104	18.3394	-0.89	0.88
30	19.0285	18.2581	17.4974	-0.93	0.92
31	18.2094	17.4484	16.6988	-0.97	0.95
32	17.4302	16.6792	15.9410	-1.00	0.99
33	16.6885	15.9480	15.2217	-1.04	1.02
34	15.9825	15.2530	14.5389	-1.08	1.06
35	15.3103	14.5920	13.8903	-1.12	1.09
36	14.6700	13.9632	13.2743	-1.16	1.13
37	14.0599	13.3650	12.6889	-1.20	1.16
38	13.4786	12.7957	12.1325	-1.23	1.20
39	12.9244	12.2537	11.6035	-1.27	1.24
40	12.3960	11.7375	11.1004	-1.31	1.27
41	11.8921	11.2459	10.6218	-1.35	1.31
42	11.4113	10.7775	10.1665	-1.39	1.34
43	10.9526	10.3311	9.7330	-1.43	1.38
44	10.5147	9.9056	9.3204	-1.48	1.42
45	10.0967	9.4999	8.9275	-1.52	1.45
46	9.6976	9.1130	8.5532	-1.56	1.49
47	9.3163	8.7439	8.1965	-1.60	1.53
48	8.9521	8.3916	7.8566	-1.64	1.57
49	8.6040	8.0554	7.5327	-1.68	1.60
50	8.2713	7.7345	7.2237	-1.73	1.64
51	7.9531	7.4280	6.9291	-1.77	1.68
52	7.6489	7.1353	6.6480	-1.81	1.72
53	7.3580	6.8556	6.3797	-1.85	1.76
54	7.0796	6.5884	6.1237	-1.90	1.79
55	6.8131	6.3329	5.8793	-1.94	1.83
56	6.5581	6.0887	5.6459	-1.99	1.87
57	6.3140	5.8552	5.4230	-2.03	1.91
58	6.0802	5.6318	5.2100	-2.07	1.95
59	5.8563	5.4181	5.0065	-2.12	1.99
60	5.6417	5.2136	4.8120	-2.16	2.03
61	5.4361	5.0178	4.6260	-2.21	2.07
62	5.2391	4.8304	4.4481	-2.25	2.11
63	5.0502	4.6510	4.2780	-2.30	2.15
64	4.8691	4.4791	4.1153	-2.35	2.19
65	4.6954	4.3145	3.9596	-2.39	2.23
66	4.5287	4.1567	3.8105	-2.44	2.27
67	4.3689	4.0055	3.6678	-2.49	2.31

Temp.((°C))	Max.(KΩ)	Normal(KΩ)	Min.(KΩ)	Tolerance(°C)	
68	4.2154	3.8605	3.5312	-2.53	2.35
69	4.0682	3.7216	3.4004	-2.58	2.39
70	3.9268	3.5883	3.2750	-2.63	2.43
71	3.7910	3.4605	3.1549	-2.68	2.48
72	3.6606	3.3378	3.0398	-2.73	2.52
73	3.5353	3.2201	2.9294	-2.77	2.56
74	3.4150	3.1072	2.8237	-2.82	2.60
75	3.2993	2.9987	2.7222	-2.87	2.64
76	3.1881	2.8946	2.6249	-2.92	2.68
77	3.0812	2.7946	2.5316	-2.97	2.73
78	2.9785	2.6986	2.4420	-3.02	2.77
79	2.8796	2.6063	2.3560	-3.07	2.81
80	2.7845	2.5176	2.2735	-3.12	2.86
81	2.6931	2.4324	2.1943	-3.17	2.90
82	2.6050	2.3505	2.1182	-3.22	2.94
83	2.5203	2.2717	2.0451	-3.28	2.99
84	2.4388	2.1960	1.9749	-3.33	3.03
85	2.3602	2.1231	1.9075	-3.38	3.07
86	2.2846	2.0530	1.8426	-3.43	3.12
87	2.2118	1.9856	1.7803	-3.48	3.16
88	2.1416	1.9207	1.7204	-3.54	3.20
89	2.0740	1.8582	1.6628	-3.59	3.25
90	2.0089	1.7981	1.6074	-3.64	3.29
91	1.9461	1.7402	1.5541	-3.70	3.34
92	1.8856	1.6844	1.5028	-3.75	3.38
93	1.8272	1.6307	1.4535	-3.80	3.43
94	1.7709	1.5789	1.4060	-3.86	3.47
95	1.7166	1.5291	1.3603	-3.91	3.52
96	1.6643	1.4810	1.3163	-3.97	3.56
97	1.6138	1.4347	1.2739	-4.02	3.61
98	1.5650	1.3900	1.2331	-4.08	3.66
99	1.5180	1.3470	1.1937	-4.13	3.70
100	1.4726	1.3054	1.1559	-4.19	3.75
101	1.4287	1.2654	1.1194	-4.24	3.80
102	1.3864	1.2268	1.0842	-4.30	3.84
103	1.3455	1.1895	1.0503	-4.36	3.89
104	1.3060	1.1535	1.0176	-4.42	3.94
105	1.2679	1.1188	0.9860	-4.47	3.98
106	1.2310	1.0853	0.9556	-4.53	4.03
107	1.1954	1.0529	0.9263	-4.59	4.08
108	1.1610	1.0217	0.8980	-4.65	4.13
109	1.1277	0.9915	0.8707	-4.70	4.17
110	1.0955	0.9624	0.8443	-4.76	4.22
111	1.0644	0.9342	0.8189	-4.82	4.27
112	1.0344	0.9070	0.7943	-4.88	4.32
113	1.0053	0.8807	0.7706	-4.94	4.37
114	0.9771	0.8553	0.7478	-5.00	4.41
115	0.9499	0.8307	0.7256	-5.06	4.46
116	0.9235	0.8070	0.7043	-5.12	4.51
117	0.8980	0.7840	0.6837	-5.18	4.56
118	0.8734	0.7618	0.6637	-5.24	4.61
119	0.8495	0.7404	0.6445	-5.30	4.66

Temp.((°C))	Max.(KΩ)	Normal(KΩ)	Min.(KΩ)	Tolerance(°C)	
120	0.8263	0.7196	0.6258	-5.36	4.71

Pipe Sensor

R25°C=10KΩ±3%

B25°C/50°C=3700K±3%

Temp.((°C))	Max.(KΩ)	Normal(KΩ)	Min.(KΩ)	Tolerance(°C)	
-30	165.2170	147.9497	132.3678	-1.94	1.75
-29	155.5754	139.5600	125.0806	-1.93	1.74
-28	146.5609	131.7022	118.2434	-1.91	1.73
-27	138.1285	124.3392	111.8256	-1.89	1.71
-26	130.2371	117.4366	105.7989	-1.87	1.70
-25	122.8484	110.9627	100.1367	-1.85	1.69
-24	115.9272	104.8882	94.8149	-1.83	1.67
-23	109.4410	99.1858	89.8106	-1.81	1.66
-22	103.3598	93.8305	85.1031	-1.80	1.64
-21	97.6556	88.7989	80.6728	-1.78	1.63
-20	92.3028	84.0695	76.5017	-1.76	1.62
-19	87.2775	79.6222	72.5729	-1.74	1.60
-18	82.5577	75.4384	68.8710	-1.72	1.59
-17	78.1230	71.5010	65.3815	-1.70	1.57
-16	73.9543	67.7939	62.0907	-1.68	1.55
-15	70.0342	64.3023	58.9863	-1.66	1.54
-14	66.3463	61.0123	56.0565	-1.64	1.52
-13	62.8755	57.9110	53.2905	-1.62	1.51
-12	59.6076	54.9866	50.6781	-1.60	1.49
-11	56.5296	52.2278	48.2099	-1.58	1.47
-10	53.6294	49.6244	45.8771	-1.56	1.46
-9	50.8956	47.1666	43.6714	-1.54	1.44
-8	48.3178	44.8454	41.5851	-1.51	1.42
-7	45.8860	42.6525	39.6112	-1.49	1.40
-6	43.5912	40.5800	37.7429	-1.47	1.39
-5	41.4249	38.6207	35.9739	-1.45	1.37
-4	39.3792	36.7676	34.2983	-1.43	1.35
-3	37.4465	35.0144	32.7108	-1.41	1.33
-2	35.6202	33.3552	31.2062	-1.38	1.31
-1	33.8936	31.7844	29.7796	-1.36	1.29
0	32.2608	30.2968	28.4267	-1.34	1.28
1	30.7162	28.8875	27.1431	-1.32	1.26
2	29.2545	27.5519	25.9250	-1.29	1.24
3	27.8708	26.2858	24.7686	-1.27	1.22
4	26.5605	25.0851	23.6704	-1.25	1.20
5	25.3193	23.9462	22.6273	-1.23	1.18
6	24.1432	22.8656	21.6361	-1.20	1.16
7	23.0284	21.8398	20.6939	-1.18	1.14
8	21.9714	20.8659	19.7982	-1.15	1.12
9	20.9688	19.9409	18.9463	-1.13	1.09
10	20.0176	19.0621	18.1358	-1.11	1.07
11	19.1149	18.2270	17.3646	-1.08	1.05
12	18.2580	17.4331	16.6305	-1.06	1.03
13	17.4442	16.6782	15.9315	-1.03	1.01
14	16.6711	15.9601	15.2657	-1.01	0.99
15	15.9366	15.2770	14.6315	-0.98	0.96

Temp.((°C))	Max.(KΩ)	Normal(KΩ)	Min.(KΩ)	Tolerance(°C)	
16	15.2385	14.6268	14.0271	-0.96	0.94
17	14.5748	14.0079	13.4510	-0.93	0.92
18	13.9436	13.4185	12.9017	-0.91	0.90
19	13.3431	12.8572	12.3778	-0.88	0.87
20	12.7718	12.3223	11.8780	-0.86	0.85
21	12.2280	11.8126	11.4011	-0.83	0.83
22	11.7102	11.3267	10.9459	-0.81	0.80
23	11.2172	10.8634	10.5114	-0.78	0.78
24	10.7475	10.4216	10.0964	-0.75	0.75
25	10.3000	10.0000	9.7000	-0.75	0.75
26	9.8975	9.5974	9.2980	-0.76	0.76
27	9.5129	9.2132	8.9148	-0.80	0.80
28	9.1454	8.8465	8.5496	-0.84	0.83
29	8.7942	8.4964	8.2013	-0.87	0.86
30	8.4583	8.1621	7.8691	-0.91	0.90
31	8.1371	7.8428	7.5522	-0.95	0.93
32	7.8299	7.5377	7.2498	-0.98	0.97
33	7.5359	7.2461	6.9611	-1.02	1.00
34	7.2546	6.9673	6.6854	-1.06	1.04
35	6.9852	6.7008	6.4222	-1.10	1.07
36	6.7273	6.4459	6.1707	-1.13	1.11
37	6.4803	6.2021	5.9304	-1.17	1.14
38	6.2437	5.9687	5.7007	-1.21	1.18
39	6.0170	5.7454	5.4812	-1.25	1.22
40	5.7997	5.5316	5.2712	-1.29	1.25
41	5.5914	5.3269	5.0704	-1.33	1.29
42	5.3916	5.1308	4.8783	-1.37	1.33
43	5.2001	4.9430	4.6944	-1.41	1.36
44	5.0163	4.7630	4.5185	-1.45	1.40
45	4.8400	4.5905	4.3500	-1.49	1.44
46	4.6708	4.4252	4.1887	-1.53	1.47
47	4.5083	4.2666	4.0342	-1.57	1.51
48	4.3524	4.1145	3.8862	-1.61	1.55
49	4.2026	3.9686	3.7443	-1.65	1.59
50	4.0588	3.8287	3.6084	-1.70	1.62
51	3.9206	3.6943	3.4780	-1.74	1.66
52	3.7878	3.5654	3.3531	-1.78	1.70
53	3.6601	3.4416	3.2332	-1.82	1.74
54	3.5374	3.3227	3.1183	-1.87	1.78
55	3.4195	3.2085	3.0079	-1.91	1.82
56	3.3060	3.0989	2.9021	-1.95	1.85
57	3.1969	2.9935	2.8005	-2.00	1.89
58	3.0919	2.8922	2.7029	-2.04	1.93
59	2.9909	2.7948	2.6092	-2.08	1.97
60	2.8936	2.7012	2.5193	-2.13	2.01
61	2.8000	2.6112	2.4328	-2.17	2.05
62	2.7099	2.5246	2.3498	-2.22	2.09
63	2.6232	2.4413	2.2700	-2.26	2.13
64	2.5396	2.3611	2.1932	-2.31	2.17
65	2.4591	2.2840	2.1195	-2.36	2.21
66	2.3815	2.2098	2.0486	-2.40	2.25
67	2.3068	2.1383	1.9803	-2.45	2.29
68	2.2347	2.0695	1.9147	-2.49	2.34

Temp.((°C))	Max.(KΩ)	Normal(KΩ)	Min.(KΩ)	Tolerance(°C)	
69	2.1652	2.0032	1.8516	-2.54	2.38
70	2.0983	1.9393	1.7908	-2.59	2.42
71	2.0337	1.8778	1.7324	-2.63	2.46
72	1.9714	1.8186	1.6761	-2.68	2.50
73	1.9113	1.7614	1.6219	-2.73	2.54
74	1.8533	1.7064	1.5697	-2.78	2.58
75	1.7974	1.6533	1.5194	-2.83	2.63
76	1.7434	1.6021	1.4710	-2.88	2.67
77	1.6913	1.5528	1.4243	-2.92	2.71
78	1.6409	1.5051	1.3794	-2.97	2.75
79	1.5923	1.4592	1.3360	-3.02	2.80
80	1.5454	1.4149	1.2942	-3.07	2.84
81	1.5000	1.3721	1.2540	-3.12	2.88
82	1.4562	1.3308	1.2151	-3.17	2.93
83	1.4139	1.2910	1.1776	-3.22	2.97
84	1.3730	1.2525	1.1415	-3.27	3.01
85	1.3335	1.2153	1.1066	-3.32	3.06
86	1.2953	1.1794	1.0730	-3.38	3.10
87	1.2583	1.1448	1.0405	-3.43	3.15
88	1.2226	1.1113	1.0092	-3.48	3.19
89	1.1880	1.0789	0.9789	-3.53	3.24
90	1.1546	1.0476	0.9497	-3.58	3.28
91	1.1223	1.0174	0.9215	-3.64	3.33
92	1.0910	0.9882	0.8942	-3.69	3.37
93	1.0607	0.9599	0.8679	-3.74	3.42
94	1.0314	0.9326	0.8424	-3.80	3.46
95	1.0030	0.9061	0.8179	-3.85	3.51
96	0.9756	0.8806	0.7941	-3.90	3.55
97	0.9490	0.8558	0.7711	-3.96	3.60
98	0.9232	0.8319	0.7489	-4.01	3.64
99	0.8983	0.8088	0.7275	-4.07	3.69
100	0.8741	0.7863	0.7067	-4.12	3.74
101	0.8507	0.7646	0.6867	-4.18	3.78
102	0.8281	0.7436	0.6672	-4.23	3.83
103	0.8061	0.7233	0.6484	-4.29	3.88
104	0.7848	0.7036	0.6303	-4.34	3.92
105	0.7641	0.6845	0.6127	-4.40	3.97
106	0.7441	0.6661	0.5957	-4.46	4.02
107	0.7247	0.6482	0.5792	-4.51	4.07
108	0.7059	0.6308	0.5632	-4.57	4.12
109	0.6877	0.6140	0.5478	-4.63	4.16
110	0.6700	0.5977	0.5328	-4.69	4.21
111	0.6528	0.5820	0.5183	-4.74	4.26
112	0.6361	0.5667	0.5043	-4.80	4.31
113	0.6200	0.5518	0.4907	-4.86	4.36
114	0.6043	0.5374	0.4775	-4.92	4.41
115	0.5891	0.5235	0.4648	-4.98	4.45
116	0.5743	0.5100	0.4524	-5.04	4.50
117	0.5600	0.4968	0.4404	-5.10	4.55
118	0.5460	0.4841	0.4288	-5.16	4.60
119	0.5325	0.4717	0.4175	-5.22	4.65
120	0.5194	0.4597	0.4066	-5.28	4.70

5.4.2 Outdoor Unit

Ambient Sensor, A and B Pipe Sensor

R25°C=5KΩ±1%

B25°C/50°C=3450K±1%

Temp.((°C))	Max.(KΩ)	Normal(KΩ)	Min.(KΩ)
-30	58.77	60.94	63.18
-29	55.73	57.75	59.84
-28	52.87	54.75	56.70
-27	50.17	51.93	53.74
-26	47.62	49.27	50.96
-25	45.22	46.76	48.34
-24	42.96	44.39	45.87
-23	40.82	42.16	43.54
-22	38.80	40.05	41.34
-21	36.90	38.06	39.26
-20	35.09	36.19	37.31
-19	33.39	34.41	35.46
-18	31.78	32.74	33.71
-17	30.26	31.15	32.07
-16	28.82	29.65	30.51
-15	27.46	28.24	29.03
-14	26.17	26.89	27.64
-13	24.94	25.62	26.32
-12	23.79	24.42	25.07
-11	22.69	23.28	23.89
-10	21.65	22.20	22.77
-9	20.66	21.18	21.72
-8	19.72	20.21	20.71
-7	18.84	19.29	19.76
-6	17.99	18.42	18.86
-5	17.19	17.59	18.00
-4	16.43	16.81	17.19
-3	15.71	16.06	16.42
-2	15.02	15.35	15.69
-1	14.37	14.68	14.99
0	13.75	14.04	14.33
1	13.16	13.43	13.70
2	12.60	12.85	13.11
3	12.07	12.30	12.54
4	11.56	11.78	12.00
5	11.07	11.28	11.49
6	10.61	10.80	11.00
7	10.17	10.35	10.53
8	9.754	9.921	10.09
9	9.354	9.511	9.669
10	8.974	9.120	9.268
11	8.611	8.747	8.885
12	8.264	8.392	8.521
13	7.934	8.053	8.173
14	7.618	7.729	7.841
15	7.317	7.421	7.525

Temp.((°C))	Max.(KΩ)	Normal(KΩ)	Min.(KΩ)
16	7.029	7.126	7.223
17	6.755	6.845	6.935
18	6.492	6.576	6.660
19	6.241	6.319	6.398
20	6.001	6.074	6.147
21	5.772	5.839	5.907
22	5.553	5.615	5.678
23	5.343	5.401	5.459
24	5.142	5.196	5.250
25	4.950	5.000	5.050
26	4.762	4.812	4.862
27	4.583	4.633	4.683
28	4.411	4.461	4.511
29	4.247	4.296	4.346
30	4.089	4.138	4.188
31	3.939	3.987	4.037
32	3.794	3.843	3.891
33	3.656	3.704	3.752
34	3.523	3.571	3.619
35	3.396	3.443	3.491
36	3.274	3.321	3.368
37	3.158	3.204	3.250
38	3.046	3.091	3.137
39	2.938	2.983	3.029
40	2.835	2.880	2.924
41	2.736	2.780	2.824
42	2.641	2.684	2.728
43	2.550	2.593	2.636
44	2.462	2.504	2.547
45	2.378	2.420	2.462
46	2.297	2.338	2.380
47	2.220	2.260	2.301
48	2.145	2.185	2.225
49	2.073	2.112	2.152
50	2.004	2.043	2.082
51	1.938	1.976	2.014
52	1.874	1.911	1.949
53	1.813	1.849	1.886
54	1.754	1.790	1.826
55	1.697	1.732	1.768
56	1.642	1.677	1.712
57	1.589	1.623	1.658
58	1.539	1.572	1.606
59	1.490	1.523	1.556
60	1.443	1.475	1.508
61	1.397	1.429	1.462
62	1.354	1.385	1.417
63	1.312	1.342	1.374
64	1.271	1.301	1.332
65	1.232	1.261	1.292
66	1.194	1.223	1.253
67	1.158	1.186	1.215
68	1.123	1.151	1.179

Temp.((°C))	Max.(KΩ)	Normal(KΩ)	Min.(KΩ)
69	1.089	1.116	1.144
70	1.056	1.083	1.111
71	1.025	1.051	1.078
72	0.9941	1.020	1.047
73	0.9647	0.9902	1.016
74	0.9363	0.9613	0.9869
75	0.9089	0.9334	0.9586
76	0.8824	0.9065	0.9312
77	0.8568	0.8805	0.9047
78	0.8321	0.8553	0.8791
79	0.8082	0.8310	0.8543
80	0.7851	0.8075	0.8304

6. System Configuration

6.1 System Configuration

After the installation and test operation of the room air conditioner have been completed, it should be operated and handled as described below. Every user would like to know the correct method of operation of the room air conditioner, to check if it is capable of cooling (or heating) well, and to know a clever method of using it.In order to meet this expectation of the users, giving sufficient explanations taking enough time can be said to reduce about 80% of the requests for servicing. However good the installation work is and however good the functions are, the customer may blame either the room air conditioner or its installation work because of improper handling. The installation work and handing over of the unit can only be considered to have been completed when its handling has been explained to the user without using technical terms but giving full knowledge of the equipment.

6.2 Instruction

Cautions

Disposal of the old air conditioner

Before disposing an old air conditioner that goes out of use, please make sure it's inoperative and safe. Unplug the air conditioner in order to avoid the risk of child entrapment.

It must be noticed that air conditioner system contains refrigerants, which require specialized waste disposal. The valuable materials contained in an air conditioner can be recycled .Contact your local waste disposal center for proper disposal of an old air conditioner and contact your local authority or your dealer if you have any question. Please ensure that the pipework of your air conditioner does not get damagedprior to being picked up by the relevant waste disposal center, and contribute to environmental awareness by insisting on an appropriate, anti-pollution method of disposal.

Disposal of the packaging of your new air conditioner

All the packaging materials employed in the package of your new air conditioner may be disposed without any danger to the environment.

The cardboard box may be broken or cut into smaller pieces and given to a waste paper disposal service. The wrapping bag made of polyethylene and the polyethylene foam pads contain no fluorochloric hydrocarbon.

All these valuable materials may be taken to a waste collecting center and used again after adequate recycling.

Consult your local authorities for the name and address of the waste materials collecting centers and waste paper disposal services nearest to your house.

Safety Instructions and Warnings

Before starting the air conditioner, read the information given in the User's Guide carefully. The User's Guide contains very important observations relating to the assembly, operation and maintenance of the air conditioner.

The manufacturer does not accept responsibility for any damages that may arise due to non-observation of the following instruction.

- Damaged air conditioners are not to be put into operation. In case of doubt, consult your supplier.

- Use of the air conditioner is to be carried out in strict compliance with the relative instructions set forth in the User's Guide.

- Installation shall be done by professional people, don't install unit by yourself.

- For the purpose of the safety,the air conditioner must be properly grounded in accordance with specifications.

- Always remember to unplug the air conditioner before openning inlet grill. Never unplug your air conditioner by pulling on the power cord. Always grip plug firmly and pull straight out from the outlet.

- All electrical repairs must be carried out by qualified electricians. Inadequate repairs may result in a major source of danger for the user of the air conditioner.

- Do not damage any parts of the air conditioner that carry refrigerant by piercing or performating the air conditioner's tubes with sharp or pointed items, crushing or twisting any tubes, or scraping the coatings off the surfaces. If the refrigerant spurts out and gets into eyes, it may result in serious eye injuries.

Cautions

• Do not obstruct or cover the ventilation grille of the air conditoner.Do not put fingers or any other things into the inlet/outlet and swing louver.

• Do not allow children to play with the air conditioner.In no case should children be allowed to sit on the outdoor unit.

Specifications

• The refrigerating circuit is leak-proof.

The machine is adaptive in following situation

■ Applicable ambient temperature range:

Cooling	Indoor	Maximum:D.B/W.B Minimum:D.B/W.B	32°C/23°C 18°C/14°C
	Outdoor	Maximum:D.B/W.B Minimum:D.B	43°C/26°C 18°C
Heating	Indoor	Maximum:D.B Minimum: D.B	27°C 15°C
	Outdoor	Maximum:D.B/W.B Minimum:D.B	27°C/18°C -7 /-8 ℃

■ If the power supply cord is damaged, it must be replaced by the manufacturer or its service agent or a similar qualified person.

■ If the fuse of indoor unit on PC board is broken,please change it with the type of T. 3.15A/ 250V.

■ The wiring method should be in line with the local wiring standard.

■ After installation, the power plug should be easily reached.

■ The waste battery should be disposed properly.

■ The appliance is not intended for use by young children or infirm persons without supervision.

■ Young children should be supervised to ensure that they do not play with the applience.

■ Please employ the proper power plug, which fit into the power supply cord.

■ The power plug and connecting cable must have acquired the local attestation.

■ In order to protect the units,please turn off the A/C first, and at least 30 seconds later, cutting off the power.

ATTENTION!

Through poor conditions of the electrical MAINS, shortly voltage drops can appear when starting the EQUIPMENT. This can influence other equipment (eg. Blinking of a lamp). If the MAINS-IMPEDANCE Zmax ＜ **X**OHM, such disturbances are not expected. (In case of need, you may contact your local supply authority for further information.)

Cautions

Safety Instruction

- Please read the following Safety Instructions carefully prior to use.
- The instructions are classified into two levels, WARNING and CAUTION according to the seriousness of possible risks and damages as follows. Compliance to the instructions are strictly required for safety use.

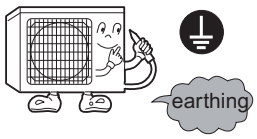
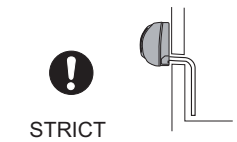
Installation

⚠WARNING

Please call Sales/Service Shop for the Installation.
Do not attempt to install the air conditioner by yourself because improper works may cause electric shock, fire, water leakage.

Installation in a inadequate place may cause accidents. Do not install in the following place.

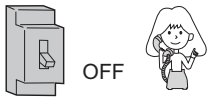
⚠CAUTION

Connect the earth cable. 	Do not install in the place where there is any possibility of inflammable gas leakage around the unit. PROHIBITION	Do not get the unit exposed to vapor or oil steam. PROHIBITION	Check proper installation of the drainage securely  STRICT ENFORCEMENT

Cautions

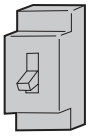
⚠ WARNING

When abnormality such as burnt-small found, immediately stop the operation button and contact sales shop.



STRICT ENFORCEMENT

Use an exclusive power source with a circuit breaker



Connect power supply cord to the outlet completely

STRICT ENFORCEMENT

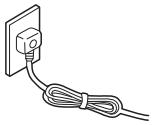
Use the proper voltage

STRICT ENFORCEMENT

Do not use power supply cord extended or connected in halfway

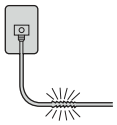
PROHIBITION

Do not use power supply cord in a bundle.



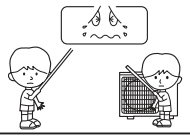
PROHIBITION

Take care not to damage the power supply cord.



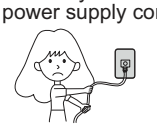
PROHIBITION

Do not insert objects into the air inlet or outlet.



PROHIBITION

Do not start or stop the operation by disconnecting the power supply cord and so on.

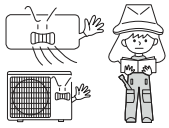


PROHIBITION

Do not channel the air flow directly at people, especially at infants or the aged.

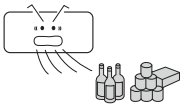
PROHIBITION

Do not try to repair or reconstruct by yourself.



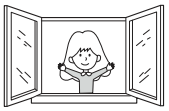
⚠ CAUTION

Do not use for the purpose of storage of food, art work, precise equipment, breeding, or cultivation.



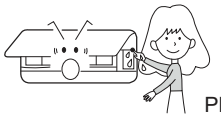
PROHIBITION

Take fresh air occasionally especially when gas appliance is running at the same time.



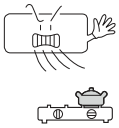
STRICT ENFORCEMENT

Do not operate the switch with wet hand.



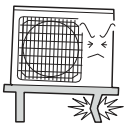
PROHIBITION

Do not install the unit near a fireplace or other heating apparatus.



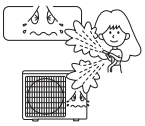
PROHIBITION

Check good condition of the installation stand



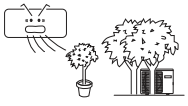
PROHIBITION

Do not pour water onto the unit for cleaning



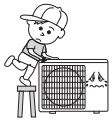
PROHIBITION

Do not place animals or plants in the direct path of the air flow



PROHIBITION

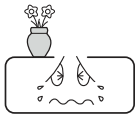
Do not place any objects on or climb on the unit.



PROHIBITION

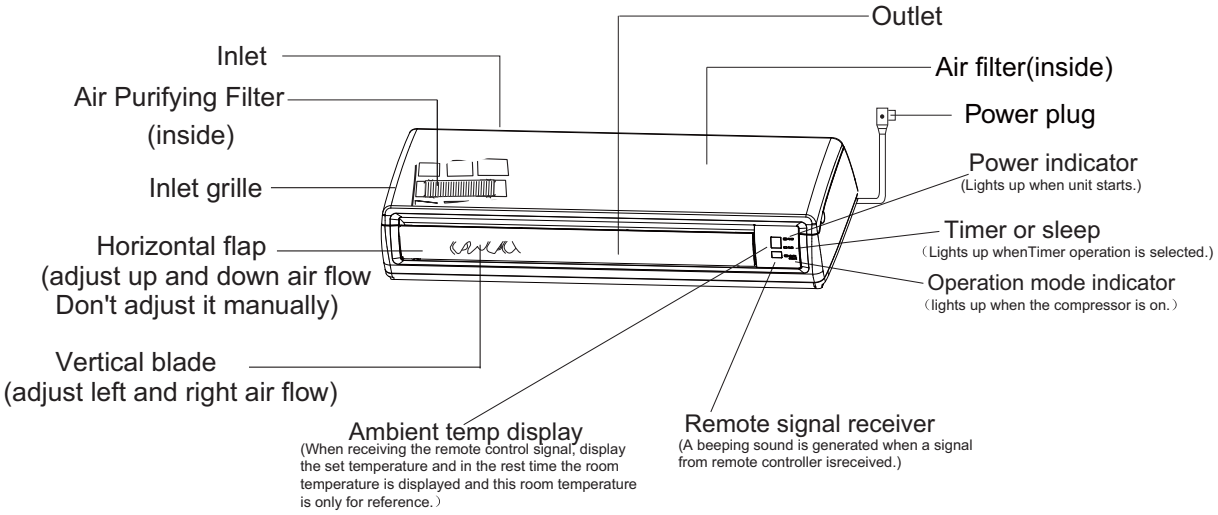
Do not place flower vase or water containers on the top of the unit.

PROHIBITION



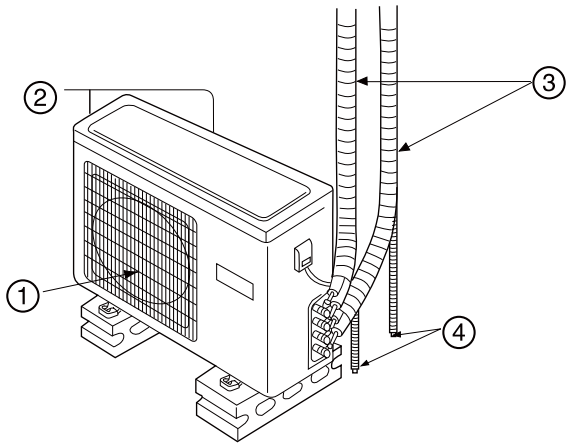
Parts and Functions

Indoor Unit


Outlet
Inlet
Air filter(inside)
Air Purifying Filter
(inside)
Power plug
Power indicator
(Lights up when unit starts.)
Inlet grille
Timer or sleep
（Lights up whenTimer operation is selected.）
Horizontal flap
(adjust up and down air flow
Don't adjust it manually)
Operation mode indicator
（lights up when the compressor is on.）
Vertical blade
(adjust left and right air flow)
Ambient temp display
(When receiving the remote control signal, display the set temperature and in the rest time the room temperature is displayed and this room temperature is only for reference.）
Remote signal receiver
(A beeping sound is generated when a signal from remote controller isreceived.)

Actual inlet grille may vary from the one shown in the manual according to the product purchased

Outdoor Unit

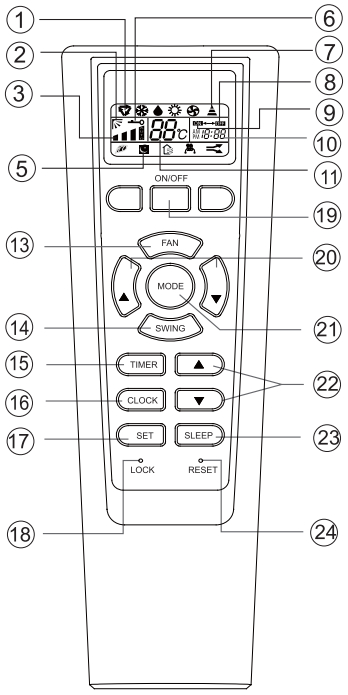


① OUTLET
② INLET
③ CONNECTING PIPING AND ELECTRICAL WIRING
④ DRAIN HOSE

Parts and Functions

If the unit which you purchased has not healthy function, Remote controller should like the following figure:

Remote controller



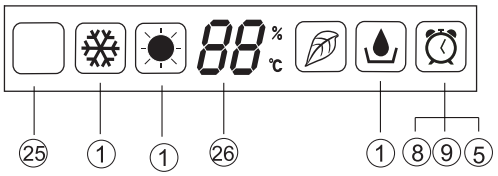
1. Operation mode display

Operation mode	AUTO	COOL	DRY	HEAT	FAN
Remote controller					
Display board					

2. SWING display
3. FAN SPEED display

5. SLEEP display
6. LOCK display

Display board



7. SIGNAL SENDING display
8. TIMER OFF display
9. TIMER ON display
10. CLOCK display
11. TEMP display
13. FAN
    Used to select fan speed LO, MED, HI, AUTO
14. SWING
    Used to set auto fan direction.
15. TIMER
    Used to select TIMER ON, TIMER OFF, TIMER ON-OFF
16. CLOCK
    Used to set correct time
17. SET
    Used to confirm timer and clock settings.
18. LOCK
    Used to lock buttons and LCD display.
19. POWER ON/OFF
    Used for unit start and stop.
20. TEMP.
    Used to select your desired temp.
21. MODE
    Used to select AUTO run, COOL, DRY and FAN operation
22. HOUR
    Used to set clock and timer setting.
23. SLEEP
    Used to select sleep mode.
24. RESET
    Used to reset the controller back to normal condition.
25. Singal receiver hole
26. Ambient temp.display
    When receiving the remote control signal, display the set temperature and in the rest time the room temperature is displayed and this room temperature is only for reference.

Clock set

When unit is started for the first time and after replacing batteries in remote controller, clock should be adjusted as follows:

Press CLOCK button, "AM" or "PM" flashes.

Press △ or ▽ to set correct time. Each press will increase or decrease 1min. If the button is kept depressed, time will change quickly.

After time setting is confirmed, press SET, "AM "and "PM" stop flashing, while clock starts working.

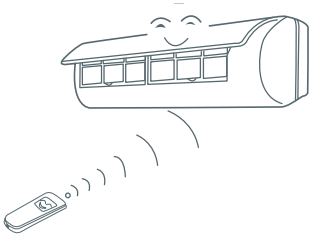
NOTE: Cooling only unit do not have displays and functions related with heating

Hints

After replacing with new batteries, remote controller will conduct self-check, displaying all information on LCD. Then, it will become normal.

Operation

Remote controller's operation



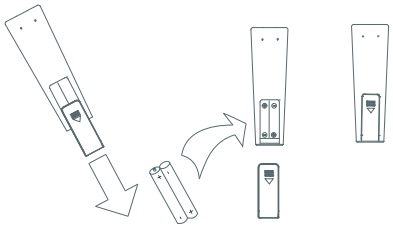
- When in use, put the signal transmission head directly to the receiver hole on the indoor unit.
- The distance between the signal transmission head and the receiver hole should be within 7m without any obstacle as well.
- Don't throw the controller, prevent it from being damaged.
- When electronic-started type fluorescent lamp or change-over type fluorescent lamp or wireless telephone is installed in the room, the receiver is apt to be disturbed in receivering the signals so the distance to the indoor unit should be shorter.

Loading of the battery

Load the batteries as illustrated. 2 R-03 batteries, resetting key (cylinder)

Remove the battery cover:

Slightly press "▼" and push down the cover.



Load the battery:

Be sure that the loading is in line with the" + "/"-" pole request as illustrated.

Put on the cover again

Confirmation indicator:

In disorderation, reload the batteries or load the new batteries after 6mins.

Note:

Use two new same-typed batteries when loading.
If the remote controller can't run normally or doesn't work at all, use a sharp pointed item to press the reset key.

Hint:

Remove the batteries in case unit won't be in usage for a long period.
If there are any display after taking-out just need to press reset key.

Power failure resume(please set and apply as necessary)

If sudden power failure occurs, the unit will resume original operation when power is supplied again.

Note: When sudden power failure happens during unit operation in power failure resume mode, if the air conditioner is not desired for use in a long period, please shut off the power supply in case that the unit automatically resume operation when power is re-supplied, or press ON/OFF to turn off the unit when power resumes.

Operation

Auto Operation

- Unit start

  Press ON/OFF on the remote controller, unit starts.

- Select operation mode

  Press MODE button. For each press, operation mode changes as follows:

  Remote controller:

  AUTO → COOL → DRY → HEAT → FAN

  Then | Select Auto operation |

- Fan speed selection

  Press FAN button. For each press, fan speed changes as follows:

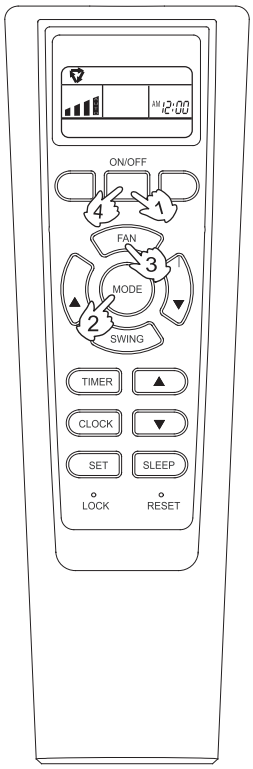
  Remote controller:

  AUTO → LO → MED → HI

  Air conditioner is running under displayed fan speed. When FAN is set to AUTO, the air conditioner automatically adjusts the fan speed according to room temperature.

- Unit stop

  Press ON/OFF button, the unit stops.



Hints

Remote controller can memorize settings in each operation mode. To run it next time just select the operation mode and it will start with the previous setting.

No reelecting is needed.(TIMER ON/OFF 、SLEEP、SWING needs reelecting)

Cautions:

On cooling only unit, heating mode is not available,

After replacing batteries, press ON/OFF, and display becomes as follows:

Operation mode: AUTO, Temp. :No

Note:

The above information is the explanation of the displayed information therefore varies with those displayed in actual operation.

Operation

Cool Operation

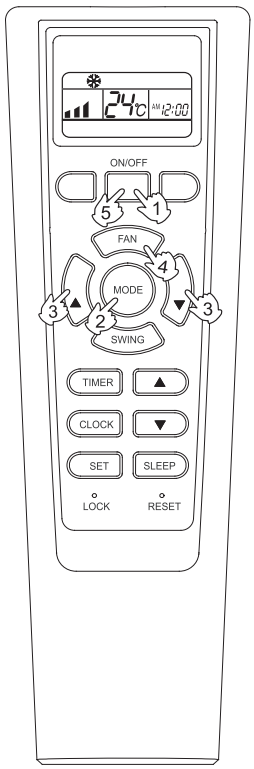
- Unit start

Press ON/OFF button, unit starts.
Previous operation status appears on display. (Not Timer setting)

- Select operation mode

Press MODE button. For each press, operation mode changes as follows:

Unit will run in operation mode displayed on LCD.
Stop display at your desired mode.

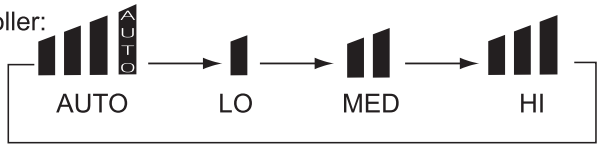


- Select temp. setting

Press TEMP button.
△ Every time the button is pressed, temp. setting increases 1°C
▽ Every time the button is pressed, temp. setting decreases 1°C
Unit will start running to reach the temp. setting on LCD.

- Fan speed selection

Press FAN button. For each press, fan speed changes as follows:
Remote controller:



Air conditioner is running under displayed fan speed.
When FAN is set to AUTO, the air conditioner automatically adjusts the fan speed according to room temperature.

- Unit stop

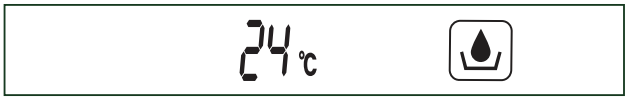
Press ON/OFF button, the unit stops.

Hints

On cooling only unit, heating mode is not available.
Remote controller can memorize each operation status. When starting it next time, just press ON/OFF button and unit will run in previous status.
No reelecting is needed.(TIMER ON/OFF、SLEEP、SWING needs reelecting)

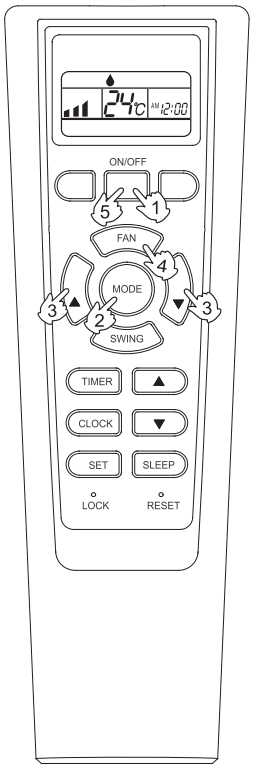
Operation

Dry Operation



- Unit start

Press ON/OFF button, unit starts.
Previous operation status appears on display. (Not Timer setting)



- Select operation mode

Press MODE button. For each press, operation mode changes as follows:

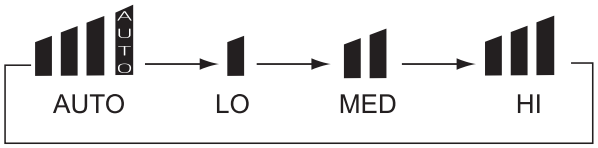
Unit will run in operation mode displayed on LCD.
Stop display at your desired mode.

- Select temp. setting

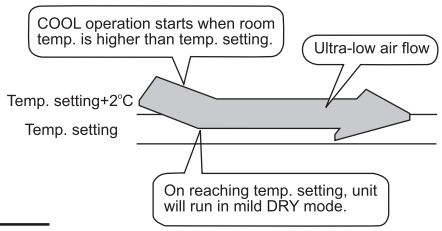
Press TEMP button.
△ Every time the button is pressed, temp. setting increases 1°C
▽ Every time the button is pressed, temp. setting decreases 1°C
Unit will start running to reach the temp. setting on LCD.

- Fan speed selection

Press FAN button. For each press, fan speed changes as follows:



Unit runs at the speed displayed on LCD.
In DRY mode, when room temperature becomes lower than temp.setting+2°C,unit will run intermittently at LOW speed regardless of FAN setting.


COOL operation starts when room temp. is higher than temp. setting.
Ultra-low air flow
Temp. setting+2°C
Temp. setting
On reaching temp. setting, unit will run in mild DRY mode.

- Unit stop

Press ON/OFF button, the unit stops.

Hints

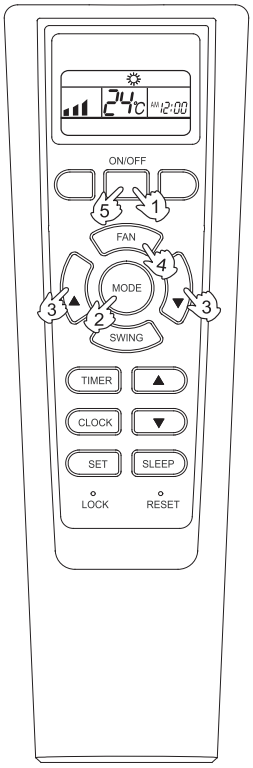
On cooling only unit, heating mode is not available.
Remote controller can memorize each operation status. When starting it next time, just press ON/OFF button and unit will run in previous status.
No reelecting is needed.(TIMER ON/OFF、SLEEP、SWING needs reelecting)

Operation

Heat Operation

- Unit start

Press ON/OFF button, unit starts.
Previous operation status appears on display. (Not Timer setting)



- Select operation mode

Press MODE button. For each press, operation mode changes as follows:

Unit will run in operation mode displayed on LCD.
Stop display at your desired mode.

- Select temp. setting

Press TEMP button.
△ Every time the button is pressed, temp. setting increases 1°C
▽ Every time the button is pressed, temp. setting decreases 1°C
Unit will start running to reach the temp. setting on LCD.

- Fan speed selection

Press FAN button. For each press, fan speed changes as follows:
Remote controller:

IN HEAT mode, warm air will blow out after a short period of the time due to cold-draft prevention function.When FAN is set to AUTO, the air conditioner automatically adjusts the fan speed according to room temperature.

- Unit stop

Press ON/OFF button, the unit stops.

Hints

Remote controller can memorize each operation status. When starting it next time, just press ON/OFF button and unit will run in previous status.
No reelecting is needed (TIMER ON/OFF SLEEP SWING needs reelcting)

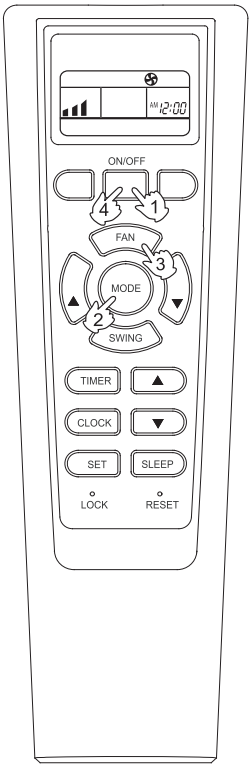
Operation

Fan Operation

- Unit start

Press ON/OFF button, unit starts.

Previous operation status appears on display. (Not Timer setting)



- Select operation mode

Press MODE button. For each press, operation mode changes as follows:

Unit will run in operation mode displayed on LCD.

Stop display at your desired mode.

- Fan speed selection

Press FAN button. For each press, fan speed changes as follows:

Unit runs at the speed displayed on LCD.

- Unit stop

Press ON/OFF button, the unit stops.

Hints

In FAN operation mode, the unit will not operate in COOL or HEAT mode but only in FAN mode. AUTO is not available in FAN mode, And temp .setting is disabled.

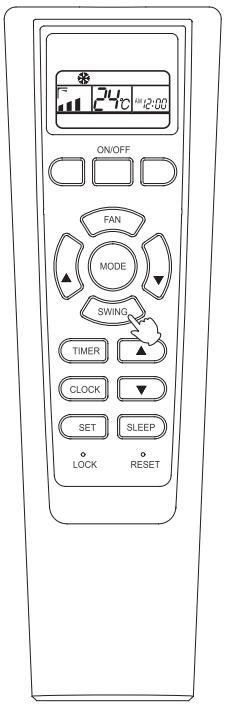
In FAN mode,SLEEP operation is not available.

Operation

Air Flow Direction Adjustment

- Status display of air sending

Horizontal flap	Remote controller
Pos.1 (Cool/Dry standard position)	Blank
Pos.2 (Upward swing)	
Pos.3 (Downward swing)	
Pos.4 (Auto swing)	



- Up and down air flow direction(Use remote controller)

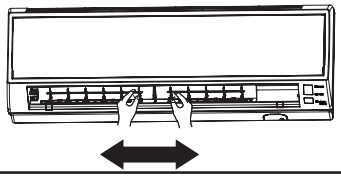
For each press of SWING button, air flow direction on remote controller display as follows according to different operation modes:

→ Pos.1 → Pos.2 → Pos.3 → Pos.4 →

The horizontal flap will swing according to the above positions

- Left and right air flow adjustment(manual)

Move the vertical blade by a knob on air conditioner to adjust left and right direction referring to Fig.



Cautions:

- Do not try to adjust the flap by hand.
- When adjusting the flap by hand,turn off the unit ,and use the remote controller to restart the unit.
- When humidity is high,condensate water might occur at air outlet if all vertical louvers are adjusted to left or right.
- It is advisable not to keep horizontal flap at downward position for a long time in COOLor DRY mode ,otherwise, condensate water might occur.

Hints

- As cold air flows downward in COOL mode, adjusting air flow horizontally will be much more helpful for a better air circulation.
- As warm air flows upward in HEAT mode, adjusting air flow oblique downwards will be much more helpful for a better air circulation.

Operation

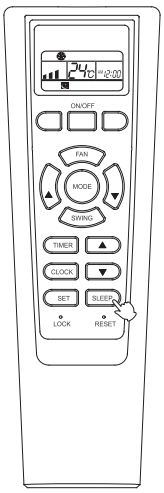
Comfortable SLEEP

Operation

Before going to bed, you can simply press the SLEEP button and unit will operate in SLEEP mode and bring you a sound sleep.

Use of SLEEP function

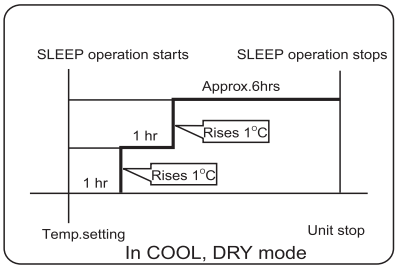
After the unit starts, set the operation status, then press SLEEP button before which the clock must be adjusted and time being set.



Operation Mode

- In COOL,DRY mode

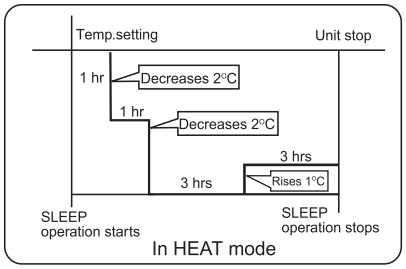
1 hours after SLEEP mode starts, temp. will become 1°C higher than temp. setting. After another 1 hours, temp. rises by 1°C further. The unit will run for further 6 hours then stops. Temp. is higher than temp. setting so that room temperature won't be too low for your sleep.



In COOL, DRY mode

- In HEAT mode

1 hours after SLEEP mode starts, temp will become 2°C lower than temp.setting. After another 1 hours, temp decrease by 2°C further. After more another 3 hours, temp. rises by 1°C further. The unit will run for further 3 hours then stops. Temp. is lower than temp. setting so that room temperature won't be too high for your sleep.



In HEAT mode

- In AUTO mode

The unit operates in corresponding sleep mode adapted to the automatically selected operation mode.

- In FAN mode

It has no SLEEP function.

- When TIMER function is set, the sleeping function can't be set up .After the sleeping function is set up, if user resets TIMER function, the sleeping function will be cancelled; the machine will be in the state of timing-on.

- Note to the power failure resume:

press the sleep button ten times in five seconds and enter this function after hearing four sounds. And press the sleep button ten times within five seconds and leave this function after hearing two sounds.

Power Failure Resume Function

If the unit is started for the first time, the compressor will not start running unless 3 minutes have elapsed. When the power resumes after power failure, the unit will run automatically, and 3 minutes later the compressor starts running.

Operation

Timer On/Off Operation

Set Clock correctly before starting Timer operation

You can let unit start or stop automatically at following times: Before you wake up in the morning, or get back from outside or after you fall asleep at night.

TIMER ON/OFF

- After unit start, select your desired operation mode.

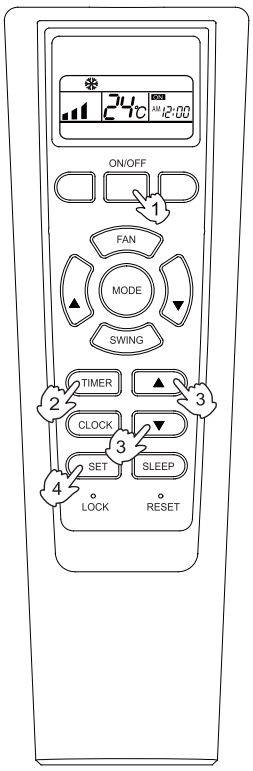
Operation mode will be displayed on LCD.

- TIMER mode selection

Press TIMER button to change TIMER mode.

Every time the button is pressed, display changes as follows:

Select your desired TIMER mode (TIMER ON or TIMER OFF) ON or OFF will flash.



- Timer setting

Press HOUR△ / ▽ button.

△ Every time the button is pressed, time increases 10 min. If button is kept depressed, time will change quickly.

▽ Every time the button is pressed, time decreases 10 min. If button is kept depressed, time will change quickly. Time will be shown on LCD. It can be adjusted within 24 hours.

- Confirming your setting

After setting correct time, press SET button to confirm, "ON" or "OFF" stops flashing

Time displayed: Unit starts or stops at x hour x min. (TIMER ON or TIMER OFF).

Timer mode indicator on indoor unit lights up.

To cancel TIMER mode

Just press TIMER button several times until TIMER mode disappears.

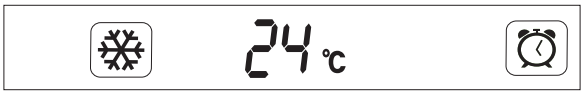
Hints

After replacing batteries or a power failure happens, Time setting should be reset.

Remote controller possesses memory function, when use TIMER mode next time, just press SET button after mode selecting if timer setting is the same as previous one.

Operation

Timer On-Off Operation



- After unit start, select your desired operation mode
  Operation mode will be displayed on LCD.

- Press TIMER button to change TIMER mode.
  Every time the button is pressed, display changes as follows:

  Select TIMER ON-OFF. "ON" will flash.

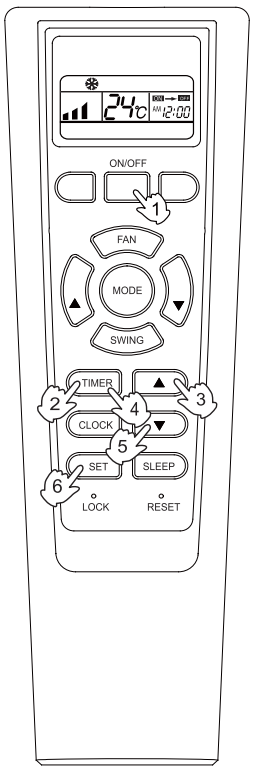
- Time setting for TIMER ON
  Press HOUR button.
  △Every time the button is pressed, time increases 10 min.
  If button is kept depressed, time will change quickly.
  ▽ Every time the button is pressed, time decreases 10 min.
  If button is kept depressed, time will change quickly.

  Time will be shown on LCD.
  It can be adjusted within 24 hours.
  AM refers to morning and PM to afternoon

- Time confirming for TIMER ON
  After time setting, press TIMER button to confirm.
  "ON" stops blinking, While "OFF" starts blinking.
  Time displayed: Unit starts at x hour x min.

- Time setting for TIMER OFF
  Follow the same procedures in "Time setting for TIMER ON".

- Time confirming for TIMER OFF
  After time setting, press SET button to confirm, "OFF" stops flashing
  Time displayed: Unit stops at X hour X min.



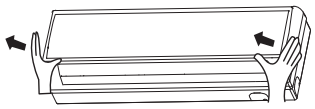
To cancel TIMER mode

■ Just press TIMER button several times until TIMER mode disappears.

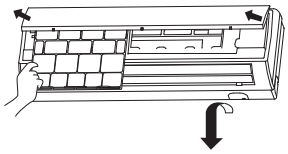
Maintenance

Replacement of Air Purifying Filter

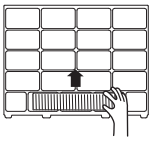
- Open the Inlet Grille
  Prop up the inlet grille by using a small device named grille-support which located in the right side of the indoor unit.

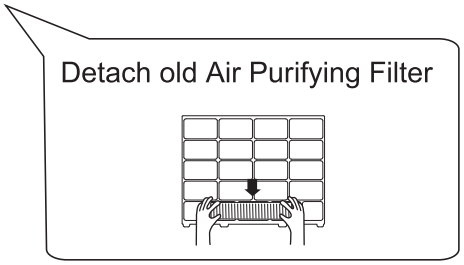


- Detach the standard air filter
  Slide the knob slightly upward to release the filter, then withdraw it.

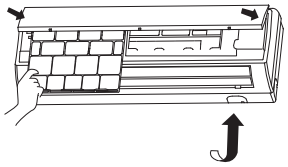


- Attach Air Purifying Filter
  Put air purifying filter appliances into the right and left filter frames.





- Attach the standard air filter
  (Necessary installation)



ATTENTION:
The white side of the photocatalyst air purifying filter face outside, and the black side face the unit.
The green side of the bacteria-killing medium air purifying filter face outside, and the white side face the unit.

- Close the Inlet Grille
  Close the Grille surely

NOTE:

- The photocatalyst air purifying filter and the bacteria-killing medium air purifying filter will be used based on real situation.
- The photocatalyst air purifying filter will be solarized in fixed time. In normal family, it will be solarized every 6 months.
- Please keep the bacteria-killing medium air purifying filter in the cool and dry conditions avoid long time directly sunshine when you stop using it,or its ability of sterilization will be reduced.

Trouble shooting

Before asking for service, check the following first.

	Phenomenon	Cause or check points
Normal Performance inspection	The system does not restart immediately.	• When unit is stopped, it won't restart immediately until 3 minutes have elapsed to protect the system. • When the electric plug is pulled out and reinserted, the protection circuit will work for 3 minutes to protect the air conditioner.
	Noise is heard	• During unit operation or at stop, a swishing or gurgling noise may be heard. At first 2-3 minutes after unit start, this noise is more noticeable. (This noise is generated by refrigerant flowing in the system.) • During unit operation, a cracking noise may be heard. This noise is generated by the casing expanding or shrinking because of temperature changes • Should there be a big noise from air flow in unit operation, air filter may be too dirty.
	Smells are generated.	• This is because the system circulates smells from the interior air such as the smell of furniture, paint, cigarettes.
	Mist or steam are blown out.	• During COOL or DRY operation, indoor unit may blow out mist. This is due to the sudden cooling of indoor air.
	In dry mode, fan speed can't be changed.	• In DRY mode, when room temperature becomes lower than temp.setting+2°C,unit will run intermittently at LOW speed regardless of FAN setting.
Multiple check		• Is power plug inserted? • Is there a power failure? • Is fuse blownout?
	Poor cooling	• Is the air filter dirty? Normally it should be cleaned every 15 days. • Are there any obstacles before inlet and outlet? • Is temperature set correctly? • Are there some doors or windows left open? • Is there any direct sunlight through the window during the cooling operation?(Use curtain) • Are there too much heat sources or too many people in the room during cooling operation?

Application temp. range of air conditioner -7°C~43°C.

7 Service Diagnosis

7.1 Caution for Diagnosis

The operation lamp flashes when any of the following errors is detected.

1.When a protection device of the indoor or outdoor unit is activated or when the thermistor malfunctions, disabling equipment operation.

2.When a signal transmission error occurs between the indoor and outdoor units. In either case, conduct the diagnostic procedure described in the following pages.

7.2 Problem Symptoms and Measures

Symptom	Check Item	Details of Measure
None of the units is operates	Check the power supply	Check to make sure that the rated voltage is supplied
	Check the indoor PCB	Check to make sure that the indoor PCB is broken
Operation sometimes stops.	Check the power supply	A power failure of 2 to 10 cycles can stop air conditioner operation.
Equipment operates but does not cool, or does not heat (only for heat pump)	Check for faulty operation of the electronic expansion valve.	Set the units to cooling operation, and compare the temperatures of the liquid side connection pipes of the connection section among rooms to check the opening and closing operation of the electronic expansion valves of the individual units.
	Diagnosis by service port pressure and operating current.	Check for insufficient gas.
Large operating noise and vibrations	Check the installation condition.	Check to make sure that the required spaces for installation (specified in the Technical Guide, etc.) are provided.

7.3 Error Codes and Description

	Code indication Indoor	Description	Outdoor LED1 blinks times
Indoor Malfunction	E1	Room temperature sensor failure	--
	E2	Heat-exchange sensor failure	--
	E4	Indoor EEPROM error	--
	E7	Communication error between the indoor and outdoor units	3 or 7
	E14	Indoor fan motor malfunction	--
Outdoor Malfunction	F6	Outdoor Senistor Error	2
	F7	Outdoor unit A's coil sensor failure	5
	F7	Outdoor unit B's coil sensor failure	9
	F12	Outdoor EEPROM error	1

7.4. Trouble Shooting

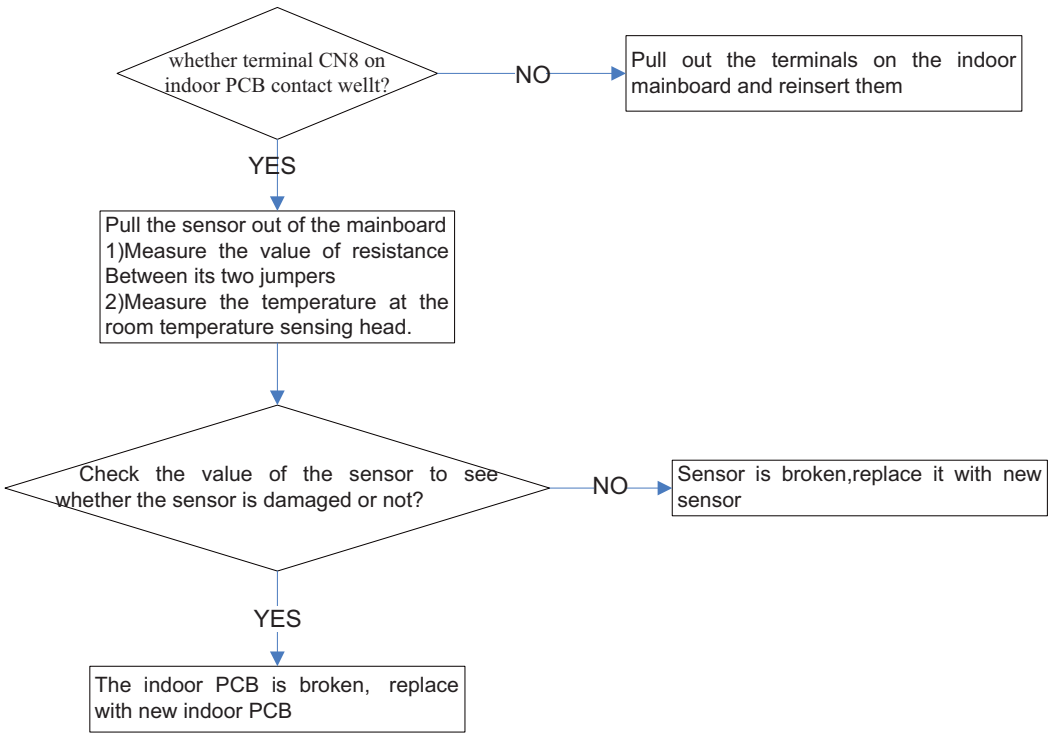
7.4.1 Thermistor or Related Abnormality (indoor unit)

Indoor Display	E1:Room temperature sensor failure E2:Indoor heat-exchange sensor failure
Method of Malfunction Detection	The temperatures detected by the thermistors are used to determine thermistor errors
Malfunction Decision Conditions	When the thermistor input is more than 4.92V or less than 0.08V during compressor operation. (* **Note:** The values vary slightly in some models)
Supposed Causes	■ Faulty connector connection ■ Faulty thermistor ■ Faulty PCB

Troubleshooting

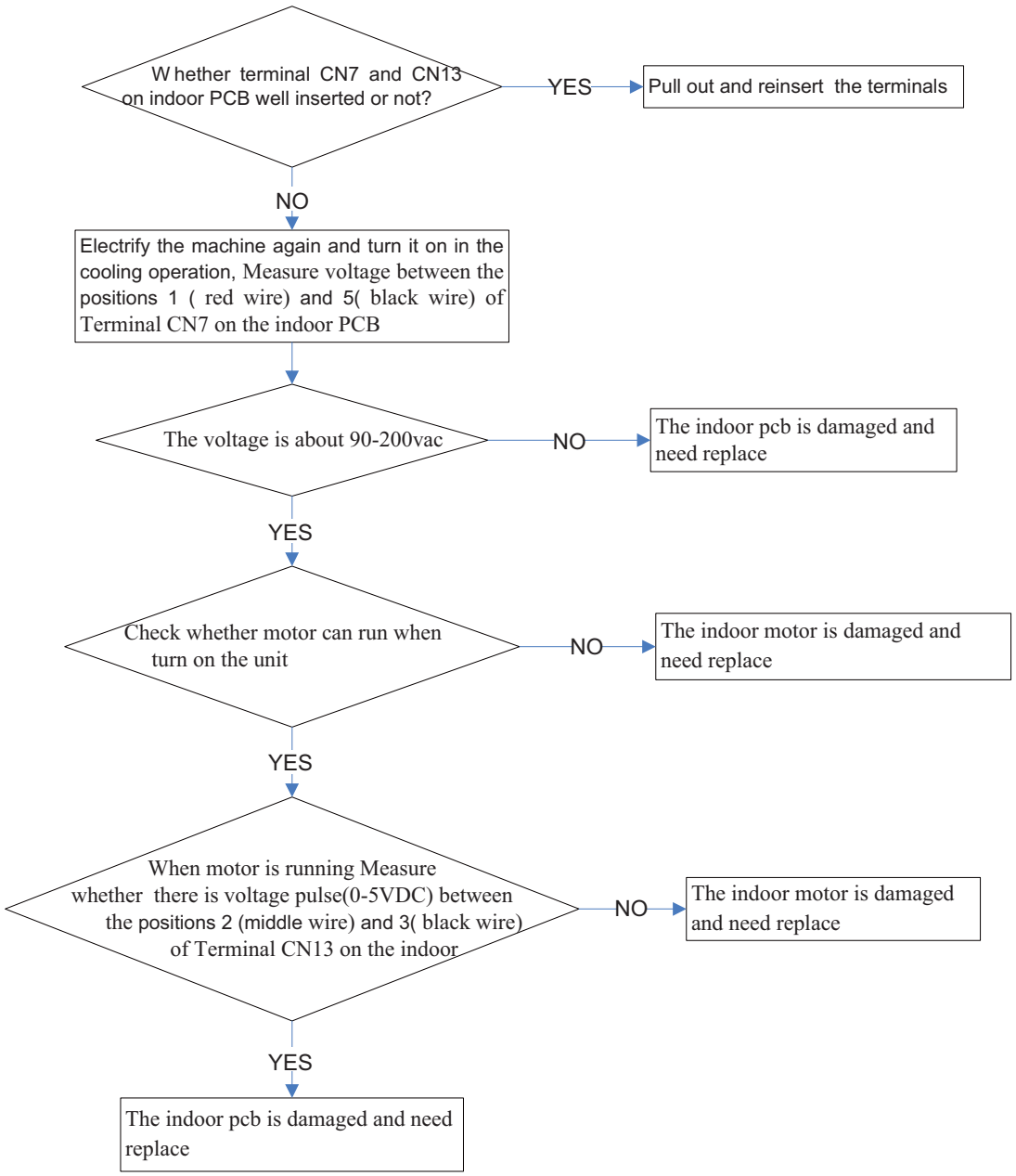
* Caution

Be sure to turn off power switch before connect or disconnect connector, or else parts damage may be occurred.


whether terminal CN8 on indoor PCB contact wellt?
NO
Pull out the terminals on the indoor mainboard and reinsert them
YES
Pull the sensor out of the mainboard
1)Measure the value of resistance Between its two jumpers
2)Measure the temperature at the room temperature sensing head.
Check the value of the sensor to see whether the sensor is damaged or not?
NO
Sensor is broken,replace it with new sensor
YES
The indoor PCB is broken, replace with new indoor PCB

7.4.2 Indoor fan motor malfunction

Indoor Display	E14
Method of Malfunction Detection	The rotation speed detected by the Hall IC during fan motor operation is used to determine abnormal fan motor operation
Malfunction Decision Conditions	When the detected rotation feedback singal don't receiced in 2 minutes
Supposed Causes	■ Operation halt due to short circuit inside the fan motor winding. ■ Operation halt due to breaking of wire inside the fan motor. ■ Operation halt due to breaking of the fan motor lead wires. ■ Dedection error due to faulty indoor unit PCB.

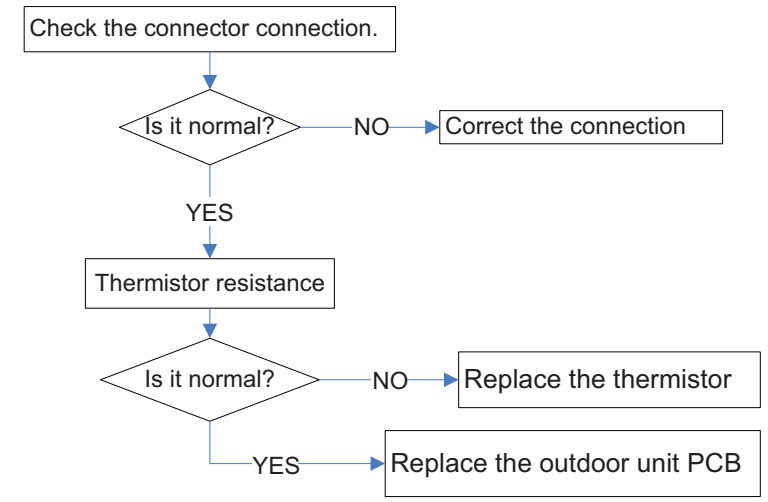

W hether terminal CN7 and CN13 on indoor PCB well inserted or not?
YES
Pull out and reinsert the terminals
NO
Electrify the machine again and turn it on in the cooling operation, Measure voltage between the positions 1 (red wire) and 5(black wire) of Terminal CN7 on the indoor PCB
The voltage is about 90-200vac
NO
The indoor pcb is damaged and need replace
YES
Check whether motor can run when turn on the unit
NO
The indoor motor is damaged and need replace
YES
When motor is running Measure whether there is voltage pulse(0-5VDC) between the positions 2 (middle wire) and 3(black wire) of Terminal CN13 on the indoor
NO
The indoor motor is damaged and need replace
YES
The indoor pcb is damaged and need replace

7.4.3 Outdoor ambient Sensor failure

Indoor Display	F6
Outdoor Display	LED1 of outdoor PCB flashes twice
Method of Malfunction Detection	The temperatures detected by the thermistors are used to determine thermistor errors
Malfunction Decision Conditions	When the thermistor input is more than 4.92V or less than 0.08V during compressor operation.(* **Note:** The values vary slightly in some models)
Supposed Causes	■ Faulty connector connection ■ Faulty thermistor ■ Faulty PCB

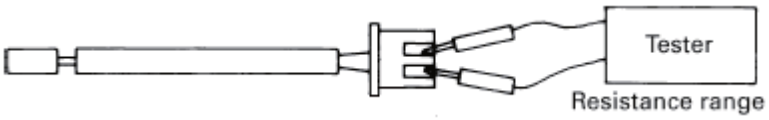
Troubleshooting

* Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



Thermistor resistance check method:

Remove the connectors of the thermistors on the PCB, and measure the resistance of thermistors using tester.The relationship between normal temperature and resistance is shown in the value of outdoor thermistor.

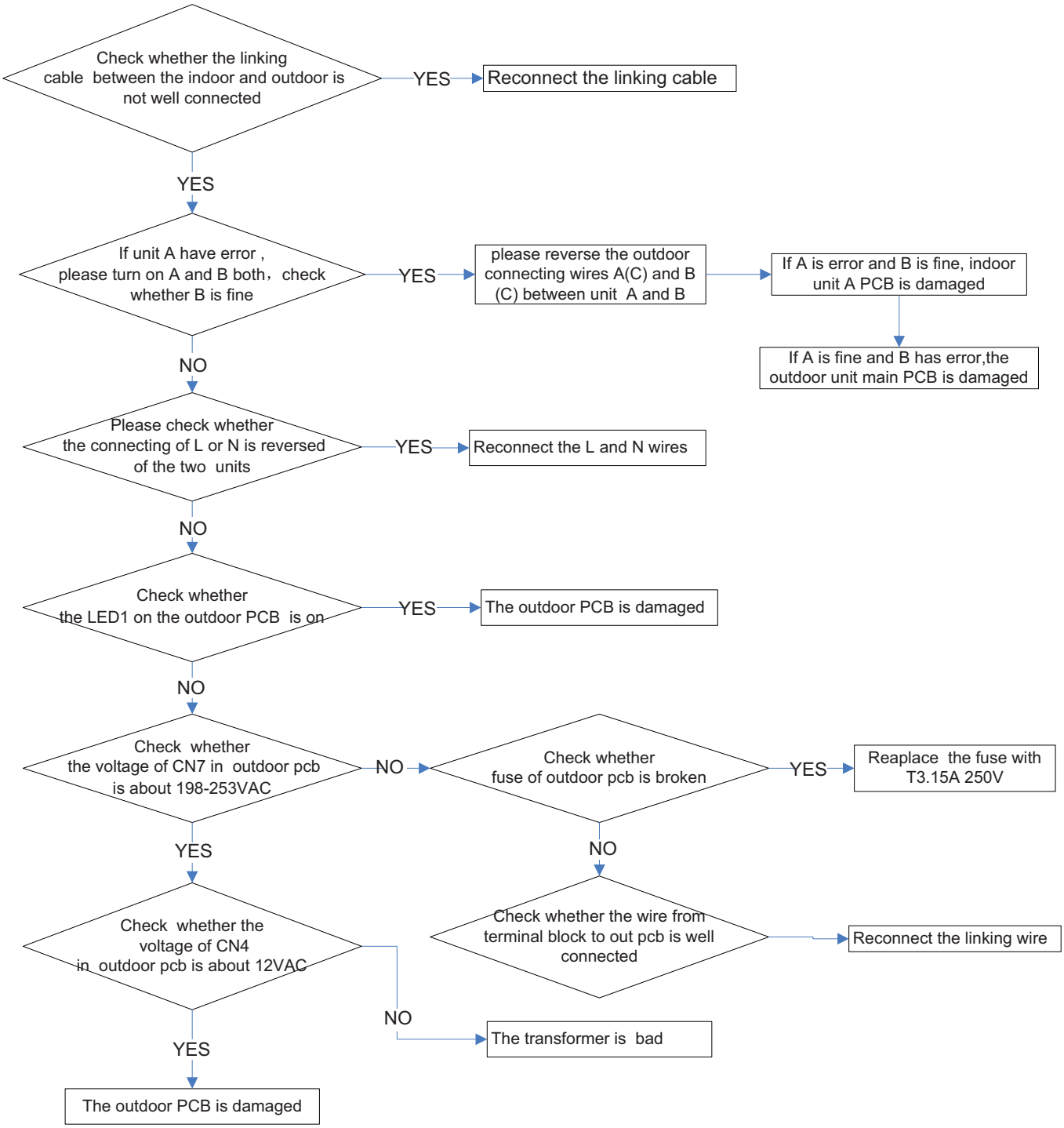


7.4.4 Communication fault between indoor and outdoor system

Indoor Display	E7
Method of Malfunction Detection	Communication is detected by checking the indoor board and outdoor board
Malfunction Decision Conditions	■ The outdoor PCB broken leads to communication fault ■ The indoor PCB broken leads to communication fault
Supposed Causes	■ The outdoor PCB is broken ■ The indoor PCB is broken ■ Communication wiring disconnected

Troubleshooting

* Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

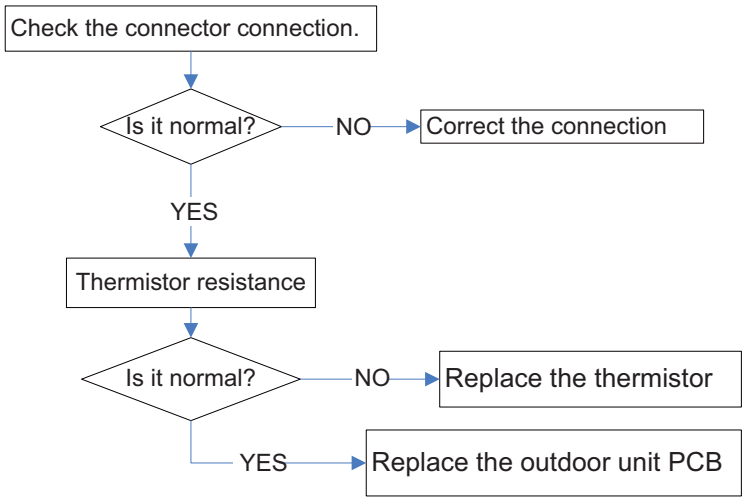

Check whether the linking cable between the indoor and outdoor is not well connected
YES
Reconnect the linking cable
YES
If unit A have error , please turn on A and B both，check whether B is fine
YES
please reverse the outdoor connecting wires A(C) and B (C) between unit A and B
If A is error and B is fine, indoor unit A PCB is damaged
If A is fine and B has error,the outdoor unit main PCB is damaged
NO
Please check whether the connecting of L or N is reversed of the two units
YES
Reconnect the L and N wires
NO
Check whether the LED1 on the outdoor PCB is on
YES
The outdoor PCB is damaged
NO
Check whether the voltage of CN7 in outdoor pcb is about 198-253VAC
NO
Check whether fuse of outdoor pcb is broken
YES
Reaplace the fuse with T3.15A 250V
YES
NO
Check whether the voltage of CN4 in outdoor pcb is about 12VAC
Check whether the wire from terminal block to out pcb is well connected
Reconnect the linking wire
NO
The transformer is bad
YES
The outdoor PCB is damaged

7.4.5 Outdoor unit A or B's coin sensor failure

Outdoor Display	LED1 of outdoor PCB flashes 5 or 9 times
Method of Malfunction Detection	This type of error is detected by checking the thermistor input voltage to the microcomputer.(A thermistor error is detected by checking the temperature)
Malfunction Decision Conditions	The thermistor input is above 4.9V or below 0.1V with the power on. * Note: The values may vary slightly in some models
Supposed Causes	■ Faulty connector connection ■ Faulty thermistor ■ Faulty PCB

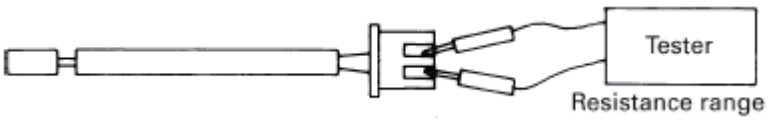
Troubleshooting

* Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



Thermistor resistance check method:

Remove the connectors of the thermistors on the PCB, and measure the resistance of thermistors using tester.The relationship between normal temperature and resistance is shown in the value of outdoor thermistor.



7.4.6 The indoor EEPROM Abnormality

Indoor Display	E4
Method of Malfunction Detection	The Data detected by the EEPROM are used to determine MCU
Malfunction Decision Conditions	When the Data of EEPROM is error or the EEPROM is damaged
Supposed Causes	■ Faulty EEPROM data ■ Faulty EEPROM ■ Faulty PCB

Troubleshooting

* Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

The indoor mainboard is damaged and needs replacing with a new one.

7.4.7 The outdoor EEPROM Abnormality

Indoor Display	F12
Outdoor Display	LED1 flash 1 times
Method of Malfunction Detection	The Data detected by the EEPROM are used to determine MCU
Malfunction Decision Conditions	When the Data of EEPROM is error or the EEPROM is damaged
Supposed Causes	■ Faulty EEPROM data ■ Faulty EEPROM ■ Faulty PCB

Troubleshooting

* Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

The outdoor mainboard is damaged and needs be replaced

8. Installations

- Read this manual before installation
- Explain sufficiently the operating means to the user according to this manual.

Necessary Tools for Installation

1.Driver
2.Hacksaw
3.Hole core drill
4.Spanner(17,19 and 26mm)
5.Torque wrench(17mm,22mm,26mm)
6.Pipe cutter
7.Flaring tool
8.Knife
9.Nipper
10.Gas leakage detector or soap-and-water solution
11.Measuring tape
12.Reamer

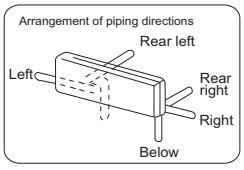
Drawing for the installation of indoor and outdoor units

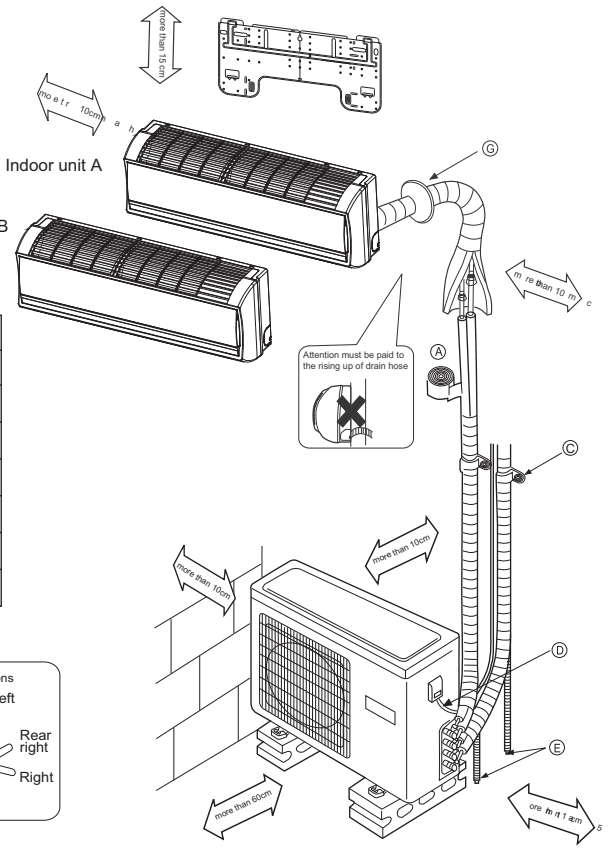
Accessory parts

No.	Accessory parts	Number of articles
①	Remote controller	1
②	R-03 dry battery	2
③	Mounting plate	1
④	Drain hose	1
⑤	ϕ4X25 Screw, Plastic cap	4
⑥	Drain-elbow	1
⑦	Cushion	4
⑧	Pipsupporting plate	1

Optional parts for piping

Mark	Parts name
Ⓐ	Non-adhesive tape
Ⓑ	Adhesive tape
Ⓒ	Saddle(L.S) with screws
Ⓓ	Connecting electric cable for indoor and outdoor
Ⓔ	Drain hose
Ⓕ	Heating insulating material
Ⓖ	Piping hole cover

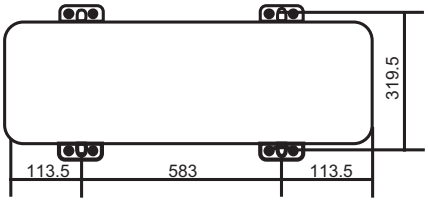



more than 15cm
more than 10cm
Indoor unit A
Indoor unit B
Attention must be paid to the rising up of drain hose
more than 10cm
more than 10cm
more than 60cm

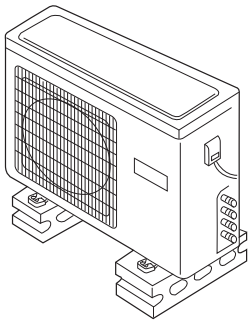
※ The marks from Ⓐ to Ⓖ in the figure are the parts numbers.

※ The distance between the indoor unit and the floor should be more than 2m.

No.0010517997



Floor fixing dimensions of the outdoor unit (Unit:mm)



Fixing of outdoor unit

- Fix the unit to concrete or block with bolts(ϕ10mm) and nuts firmly and horizontally.
- When fitting the unit to wall surface, roof or rooftop, fix a supporter surely with nails or wires in consideration of earthquake and strong wind.
- If vibration may affect the house, fix the unit by attaching a vibration-proof mat.

Indoor Unit Selection of Installation Place Outdoor Unit

- Place, robust not causing vibration, where the body can be supported sufficiently.
- Place, not affected by heat or steam generated in the vicinity, where inlet and outlet of the unit are not disturbed.
- Place, possible to drain easily, where piping can be connected with the outdoor unit.
- Place, where cold air can be spread in a room entirely.
- Place, nearby a power receptacle, with enough space around. (Refer to drawings).
- Place where the distance of more than lm from televisions, radios, wireless apparatuses and fluorescent lamps can be left.
- In the case of fixing the remote controller on a wall, place where the indoor unit can receive signals when the fluorescent lamps in the room are lightened.
- Place, which is less affected by rain or direct sunlight and is sufficiently ventilated.
- Place, possible to bear the unit, where vibration and noise are not increased.
- Place, where discharged wind and noise do not cause a nuisance to the neighbors.
- Place, where a distance marked ⇔is available as illustrated in the above figure.

Power Source

- Before inserting power plug into receptacle, check the voltage without fail. The power source is the same as the corresponding name plate.
- Install an exclusive branch circuit of the power.
- A receptacle shall be set up in a distance where the power cable can be reached. Do not extend the cable by cutting it.

Selection of pipe

- To this unit, both liquid and gas pipes shall be insulated as they become low temperature in operation.
- Use optional parts for piping set or pipes covered with equivalent insulation material.
- The thickness of the pipe must be 0.8 mm at least.

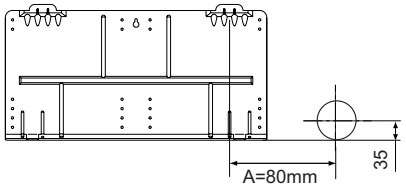
Liquid pipe(ϕ)	6.35mm(1/4")
Gas pipe(ϕ)	9.52mm(3/8")

Indoor unit

1.Fitting of the Mounting Plate and Positioning of the wall Hole

When the mounting plate is first fixed

1.Carry out, based on the neighboring pillars or lintels, a proper leveling for the plate to be fixed against the wall, then temporarily fasten the plate with one steel nail.
2. Make sure once more the proper level of the plate, by hanging a thread with a weight from the central top of the plate, then fasten securely the plate with the attachment steel nail.
3. Find the wall hole location A using a measuring tape



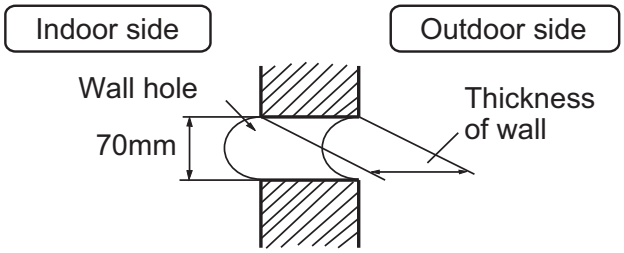
Fit the level line

When the mounting plate is fixed side bar and lintel

- Fix to side bar and lintel a mounting bar, Which is separately sold, and then fasten the plate to the fixed mounting bar.
- Refer to the previous article, " When the mounting plate is first fixed ", for the position of wall hole.

2.Making a Hole on the Wall and Fitting the Piping Hole Cover

- Make a hole of 70 mm in diameter, slightly descending to outside the wall.
- Install piping hole cover and seal it off with putty after installation



(Section of wall hole) Ⓖ Piping hole pipe

3.Installation of the Indoor Unit

Drawing of pipe

[Rear piping]

- Draw pipes and the drain hose, then fasten them with the adhesive tape

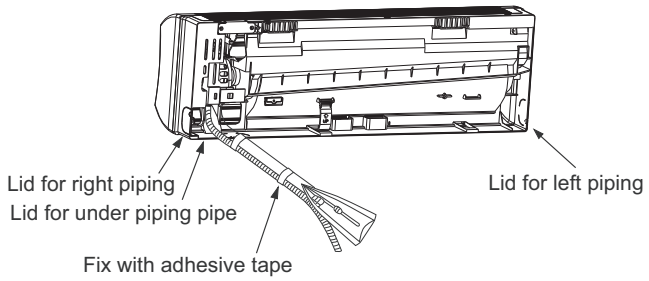
[Left • Left-rear piping]

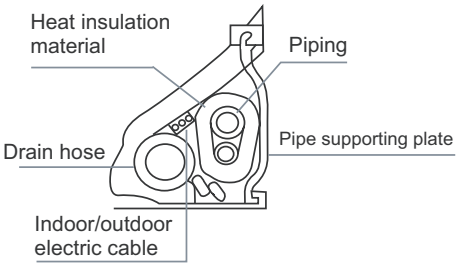
- In case of left side piping, cut away, with a nipper, the lid for left piping.
- In case of left-rear piping, bend the pipes according to the piping direction to the mark of hole for left-rear piping which is marked on heat insulation materials.

1. Insert the drain hose into the dent of heat insulation materials of indoor unit.
2. Insert the indoor/outdoor electric cable from backside of indoor unit, and pull it out on the front side, then connect them.
3. Coat the flaring seal face with refrigerant oil and connect pipes.
   Cover the connection part with heat insulation materials closely, and make sure fixing with adhesive tape

Indoor unit

1. Insert the drain hose into the dent of heat insulation materials of indoor unit.
2. Insert the indoor/outdoor electric cable from backside of indoor unit, and pull it out on the front side, then connect them.
3. Coat the flaring seal face with refrigerant oil and connect pipes.
   Cover the connection part with heat insulation materials closely, and make sure fixing with adhesive tape





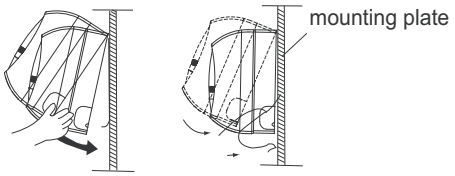
- Indoor/outdoor electric cable and drain hose must be bound with refrigerant piping by protecting tape.

[Other direction piping]

- Cut away, with a nipper, the lid for piping according to the piping direction and then bend the pipe according to the position of wall hole. When bending, be careful not to crash pipes.
- Connect beforehand the indoor/outdoor electric cable, and then pull out the connected to the heat insulation of connecting part specially.

Fixing the indoor unit body

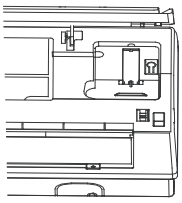
- Hang surely the unit body onto the upper notches of the mounting plate. Move the body from side to side to verify its secure fixing.
- In order to fix the body onto the mounting plate,hold up the body aslant from the underside and then put it down perpendicularly.



4.Connecting the indoor/outdoor Electric Cable

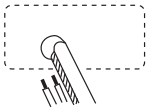
Removing the wiring cover

- Remove terminal cover at right bottom corner of indoor unit, then take off wiring cover by removing its screws.



Indoor unit

When connecting the cable after installing the indoor unit



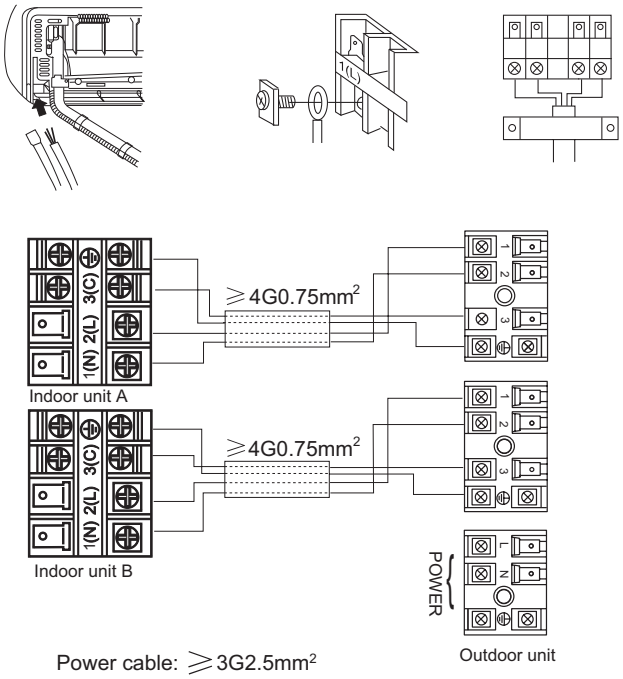
1. Insert from outside the room cable into left side of the wall hole, in which the pipe has already existed.
2. Pull out the cable on the front side, and connect the cable making a loop .

When connecting the cable before installing the indoor unit

- Insert the cable from the back side of the unit, then pull it out on the front side.
- Loosen the screws and insert the cable ends fully into terminal block, then tighten the screws.
- Pull the cable slightly to make sure the cables have been properly inserted and tightened.
- After the cable connection, never fail to fasten the connected cable with the wiring cover .

Note : When connecting the cable, confirm the terminal number of indoor and outdoor units carefully. If wiring is not correct, proper operation can not be carried out and will cause defect.

1. If the supply cord is damaged, it must be replaced by the manufacturer or its service agent or a similar qualified person.The type of connecting wire is H05RN-F or H07RN-F.
2. If the fuse on PC board is broken please change it with the type of T. 3.15A/250 V.
3. The wi ring method should be in line with the local wiring standard.
4. After installation, the power plug should be easily reached.
5. A breaker should be incorporated into fixed wiring. The breaker should be all-pole switch and the distance between its two contacts should be not less than 3mm.



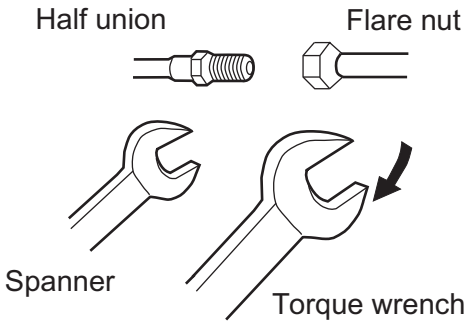
Outdoor unit

1.Installation of Outdoor Unit

Install according to Drawing for the installation of indoor and outdoor units

2.Connection of pipes

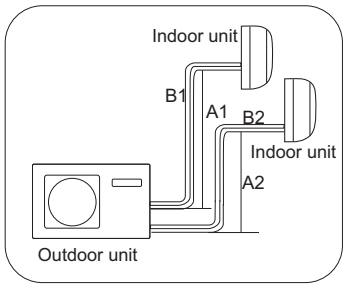
- To bend a pipe, give the roundness as large as possible not to crush the pipe ,and the bending radius should be 30 to 40 mm or longer.
- Connecting the pipe of gas side first makes working easier.
  The connection pipe is specialized for R410A.

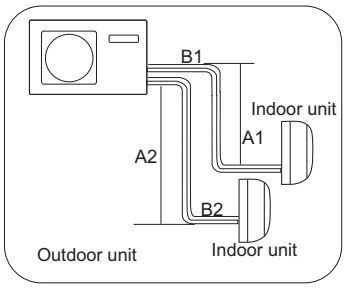


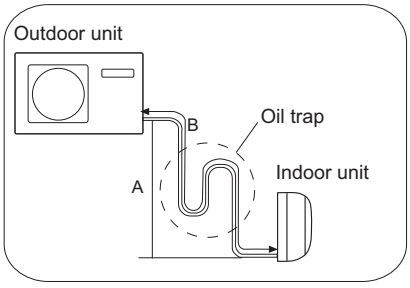
Forced fastening without careful centering may damage the threads and cause a leakage of gas.

Pipe Diameter (ϕ)	Fastening torque
Liquid side 6.35mm(1/4")	18N.m
Gas side 9.52mm(3/8")	42N.m

Be careful that matters, such as wastes of sands, etc. shall not enter the pipe.
The standard pipe length is 5m. If it is over 5m, the function of the unit will be affected. If the pipe has to be lengthened, the refrigerant should be charged, according to 20 g/m. But the charge of refrigerant must be conducted by professional air conditioner engineer. Before adding additional refrigerant, perform air purging from the refrigerant pipes and indoor unit using a vacuum pump,then charge additional refrigerant.







In case A is more than 5m

CAUTION

- Max.Elevation: $A1_{max}$=10m $A2_{max}$=10m
- In case the elevation A is more than 5m, oil trap shoud be installed every 5~7m
- Max. Length: $B1_{max}$=15m $B2_{max}$=15m
- In case the pipe length B is more than 5m, the refrigerant should be charged, according to 20 g/m.

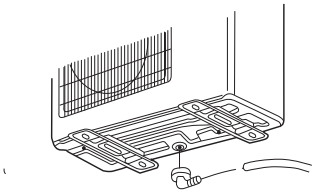
3.Connection

- Use the same method on indoor unit. Loosen the screws on terminal block and insert the plugs fully into terminal block, then tighten the screws.
- Insert the cable according to terminal number in the same manner as the indoor unit.
- If wiring is not correct, proper operation can not be carried out and controller may be damaged.
- Fix the cable with a clamp.

4.Attaching Drain-Elbow

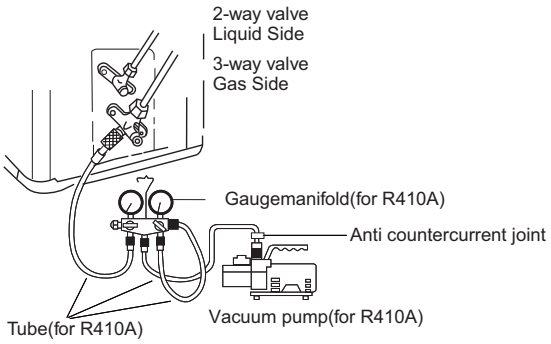
- If the drain-elbow is used, please attach it as figure.

  Note: Only for heat pump unit.



Outdoor unit

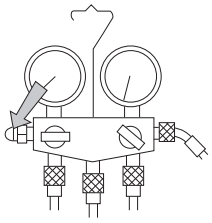
6.Purging Method:To use vacuum pump



① Detach the service port's cap of 3-way valve, the valve rod's cap for 2-way valve and 3-way's, connect the service port into the projection of charge hose (low) for gaugemanifold. Then connect the projection of charge hose (center) for gaugemanifold into vacuum pump.

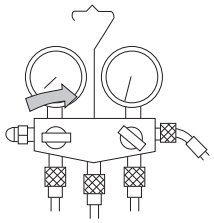
② Open the handle at low in gaugemanifold, operate vacuum pump. If the scale-moves of gause (low) reach vacuum condition in a moment, check ① again.

② Open

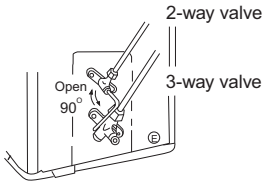


③ Vacuumize for over 15min. And check the level gauge which should read -0.1 MPa (-76 cm Hg) at low pressure side. After the completion of vacuumizing, close the handle 'Lo' in gaugemanifold and stop the operation of the vacuum pump.
Check the condition of the scale and hold it for 1-2min. If the scale-moves back in spite of tightening, make flaring work again, the return to the beginning of ③ .

③ Close



④ Open the valve rod for the 2-way valve to an angle of anticlockwise 90 degrees.
After 6 seconds, close the 2-way valve and make the inspection of gas leakage.

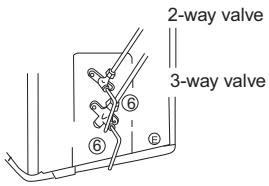


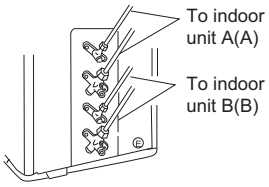
⑤ No gas leakage?

In case of gas leakage, tighten parts of pipe connection. If leakage stops, then proceed ⑥ steps.

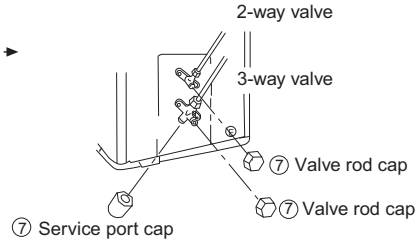
If it does not stop gas leakage, discharge whole refrigerants from the service port. After flaring work again and vacuumize, fill up prescribed refrigerant from the gas cylinder.

⑥ Detach the charge hose from the service port, open 2-way valve and 3-way. Turn the valve rod anticlockwise until hitting lightly.





⑦ To prevent the gas leakage, turn the service port's cap, the valve rod's cap for 2-way valve and 3-way's a little more than the point where the torque increases suddenly.



⑧ After attaching the each caps, check the gas leakage around the caps.

CAUTION:

1.If the refrigerant of the air conditioner leaks, it is necessary to discharge all the refrigerant. Vacuumize first, then charge the liquid refrigerant into air conditioner according to the amount marked on the name plate.

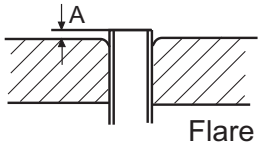
2.Please do not let other cooling medium, except specified one (R410A), or air enter into the cooling circulation system. Otherwise, there will be abnormal high pressure in the system to make it crack and lead to personal injuries.

1.Power Source Installation

- The power source must be exclusively used for air conditioner. (Over I0A)
- In the case of installing an air conditioner in a moist place, please install an earth leakage breaker.
- For installation in other places, use a circuit breaker as far as possible.

2.Cutting and Flaring Work of Piping

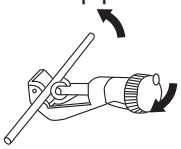
- Pipe cutting is carried out with a pipe cutter and burs must be removed.
- After inserting the flare nut, flaring work is carried out.



Flare tooling die

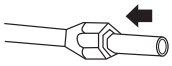
	Flare tool for R410A	Conventional flare tool	
	Clutch-type	clutch-type(Rigid-type)	Wing-nut type (Imperial-type)
A	0~0.5mm	1.0~1.5mm	1.5~2.0mm

1.Cut pipe

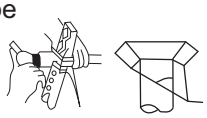


2.Remove burs

3.Insert the flare nut



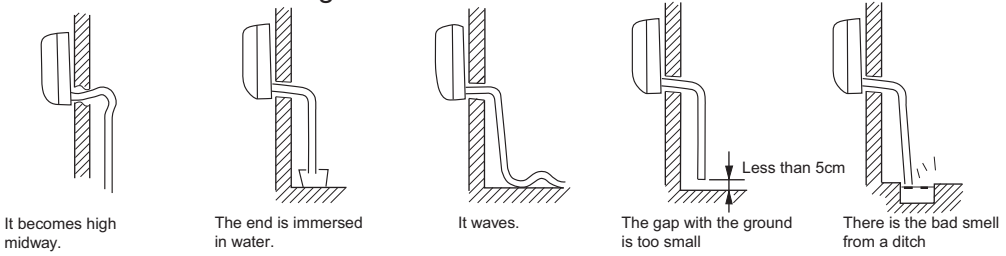
4.Flare pipe



Correct	Incorrect				
	Lean	Damage of flare	Crack	Partial	Too outside

3.On Drainage

Please install the drain hose so as to be downward slope without fail.
Please don't do the drainage as shown below.



It becomes high midway. | The end is immersed in water. | It waves. | The gap with the ground is too small | There is the bad smell from a ditch

- Please pour water in the drain pan of the indoor unit, and confirm that drainage is carried out surely to outdoor.
- In case that the attached drain hose is in a room, please apply heat insulation to it without fail.

Check for Installation and Test Run

- Please kindly explain to our customers how to operate through the instruction manual.

Check Items for Test Run

☐ Put check mark ✓ in boxes

☐ Gas leak from pipe connecting?
☐ Heat insulation of pipe connecting?
☐ Are the connecting wirings of indoor and outdoor firmly inserted to the terminal block?
☐ Is the connecting wiring of indoor and outdoor firmly fixed?
☐ Is drainage securely carried out?
☐ Is the earth line securely connected?
☐ Is the indoor unit securely fixed?
☐ Is power source voltage abided by the code?
☐ Is there any noise?
☐ Is the lamp normally lighting?
☐ Are cooling and heating (when in heat pump) performed normally?
☐ Is the operation of room temperature regulator normal?

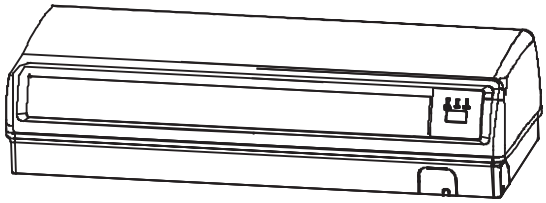
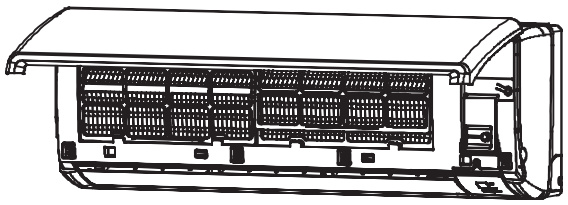
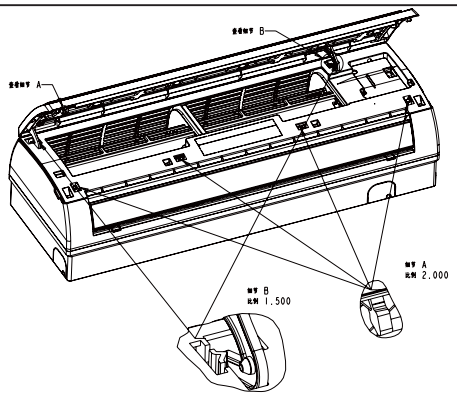
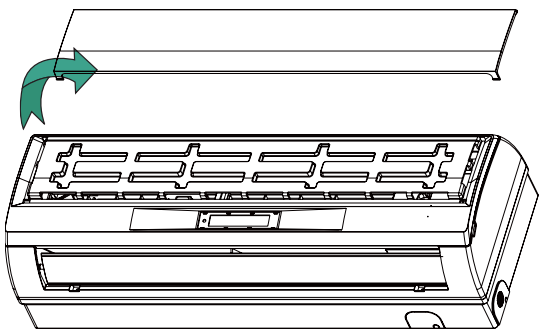
9. Removal Procedure

9.1 The removal procedure of Indoor Unit

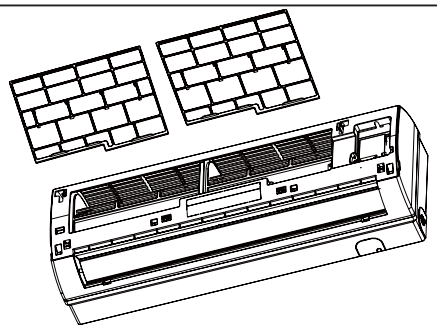
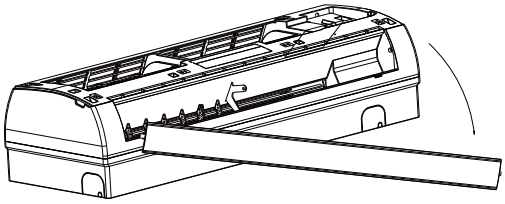
Procedure

Warning Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

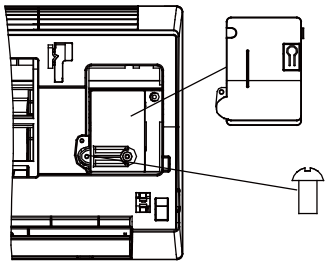
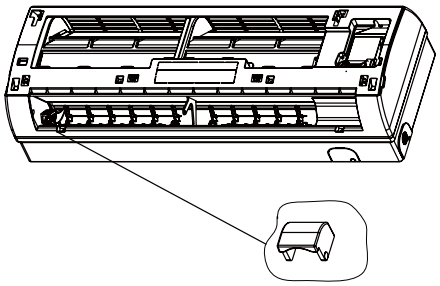
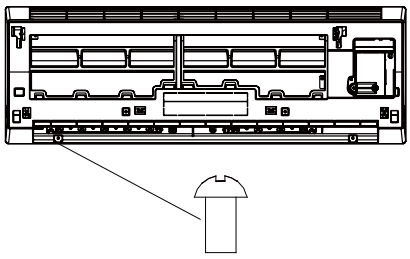
9.1.1 Removal of Air Filters and Front panel

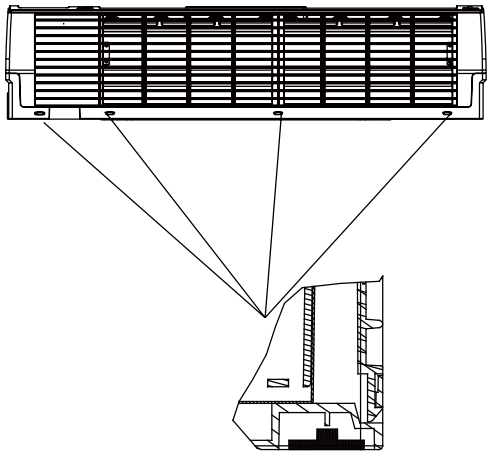
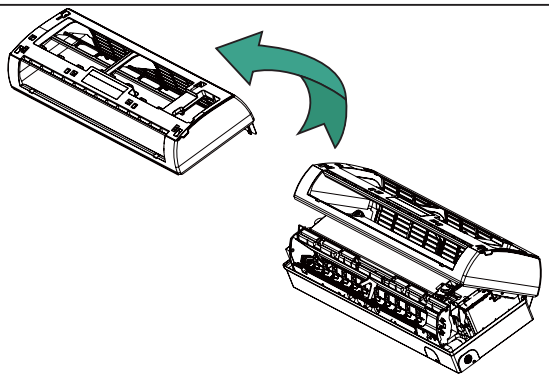
Step	Procedure	Points
1. Features		
2. Remove the air filters Hold the front panel by the tabs on the both sides and list it until it stops with a click		
3. Remove the front panel Open the front panel to the horizontal position. Release the both sides pivots and remove the front panel.	 	■ Start the removal procedure of front grile when the panel are closed. ■ Slide the front panel side to side to release each axis. ■ When assembling, align the right and left axes with grooves in turn and insert them to the end.

9.1.2 Removal of Filter and Blade

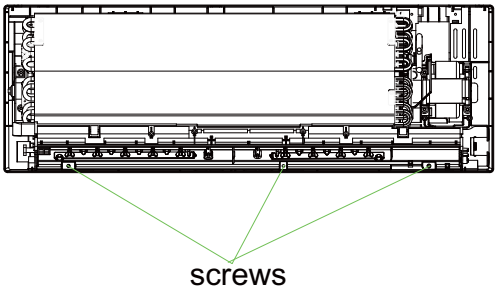
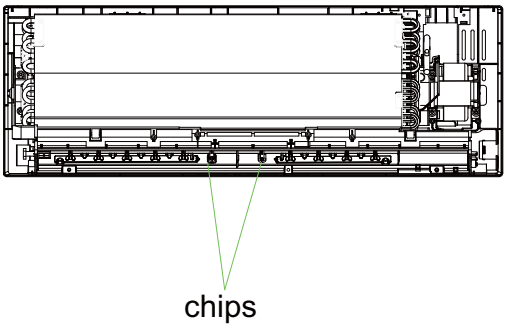
Step	Procedure	Points
1.Removal of Filter and Blade		
push the filter and remove the filters.		
2.Removal of the blade		
		■ knock down the midle dowel first and then the ports.

9.1.3 Removal of the Front Grill

Step	Procedure	Points
1. Remove the grill cover		
		
Pull the two bolt down and Loosen the marked two screw covers.		
Then pull the two screws		

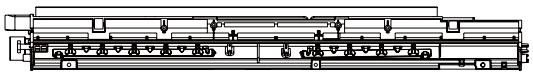
Step	Procedure		Points
	Release the marked hooks.		■ When assembling,installthe front grille horizontally so as not to stuff the flap inside. ■ When assembling,make sure the three hooks are caught properly.
	Pull the front grille out horizontally and remove it.		

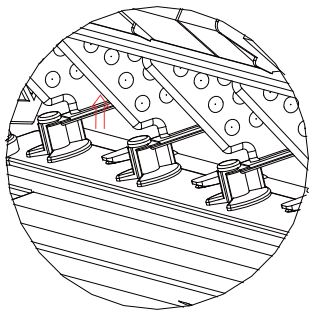
9.1.4 Removal of Drain Pan

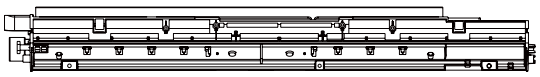
Step	Procedure		Points
1	Loosen the marked screws.		
2	Pull the two chips out from the frame.		
3	Pull out the drain pan.		

9.1.5 Removal of Vertical Blades and Swing Motor

Step	Procedure	Points
■ Remove the assembly of the outlet grille.		
1. Remove the vertical blades.		
1	Push the hooks on the back of the vertical blades and remove.	

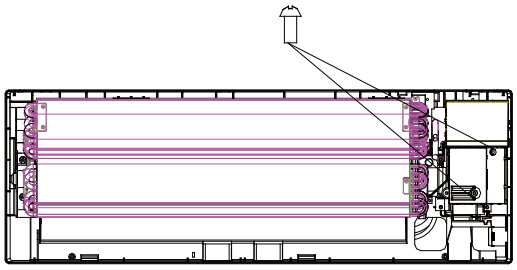


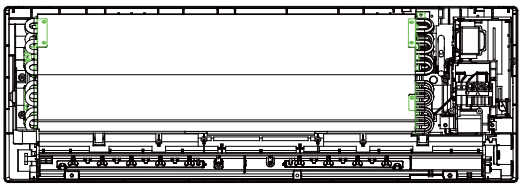


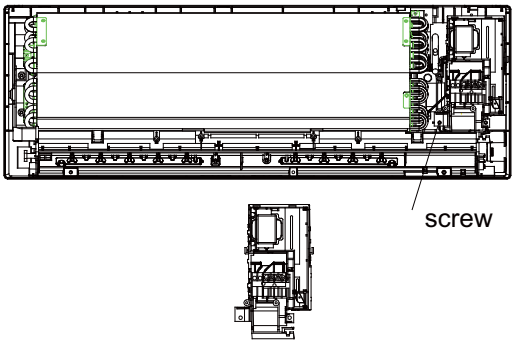


9.1.6 Removal of Electrical Box

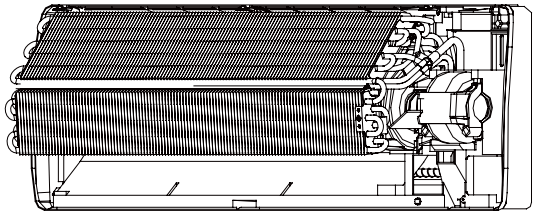
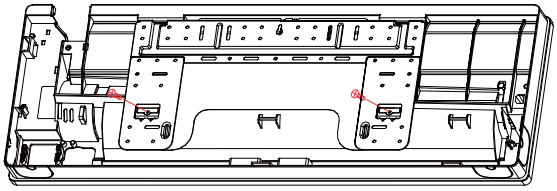
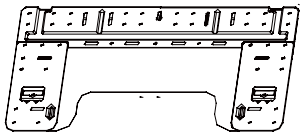
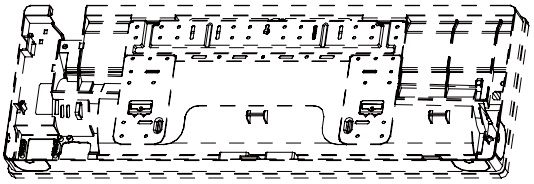
Step	Procedure	Points
■ Remove the front grille.		■ Discharge the static electricity from your body before touching the electrical parts like signal receiver PCB. It may cause malfunction of PCB.
1. Remove the electrical box.		
1	Loosen the screw marked and pull the electrical control box cover out	
2	Removal the marked parts flow the numbers	first second third
3	Losson the marked scres then pull the control box	■ When assembling, insert the left hook of the drip proof plate into the hem plate of the heat exchanger.

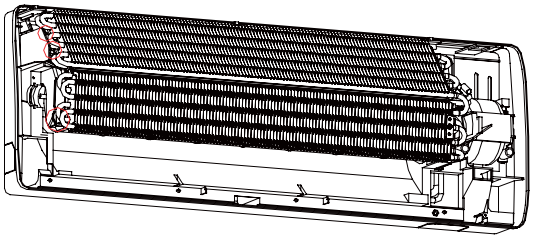
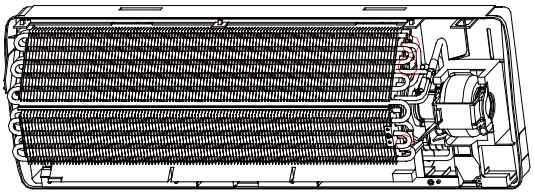
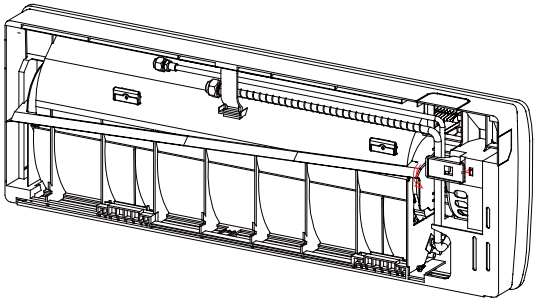
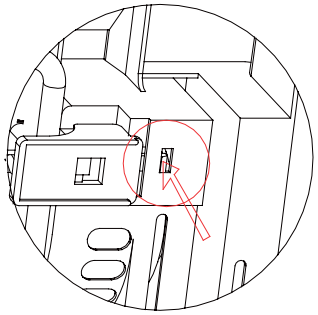
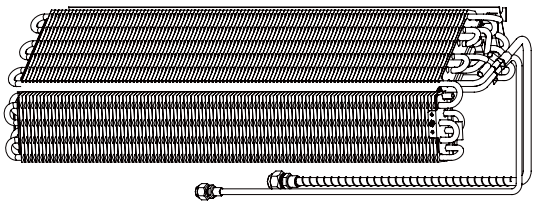
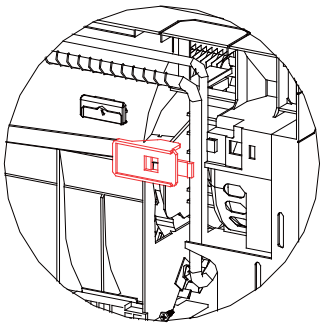




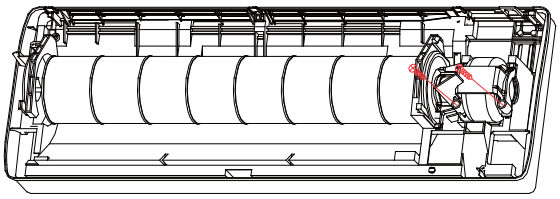
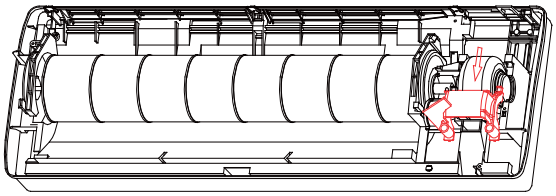
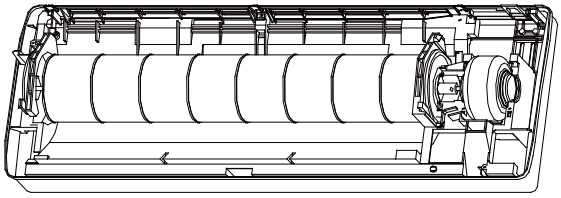
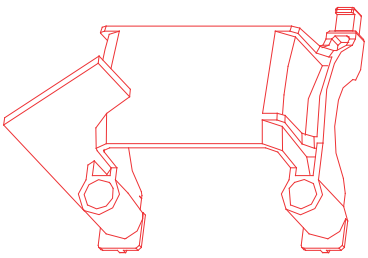


9.1.7 Removal of Heat Exchanger

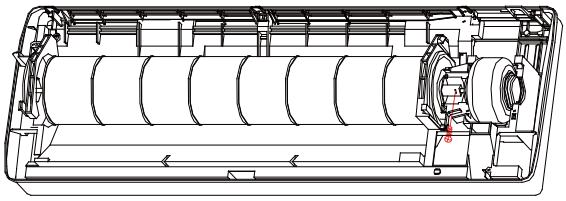
Step	Procedure	Points
		■ You can detach the indoor unit without removing the assembly of the outlet grille. ⚠ Caution If gas leaks, repair the spot of leaking, then collect all refrigerant from the unit. After conducting vacuum drying, recharge proper amount of refrigerant. ⚠ Caution Do not contaminate any gas (including air) other than the specified refrigerant (R410A), into refrigerant cycle. (Contaminating of air or other gas causes abnormal high pressure in refrigerating cycle, and this results in pipe breakage or personal injuries.)
1 Loosen the screws fixed to the installation plate.		
2 Loosen the marked hooks		
3 Loosen the marked screws and remove mounting plate	 	■ Pay attention so that the residual water in the drain will not make the floor wet. ■ In case that a drain hose is buried inside a wall, remove it after the drain hose in the wall is pulled out. ■ Use two wrenches to disconnect pipes. ■ When disconnecting pipes, cover every nozzle with caps so as not to let dust and moisture in.

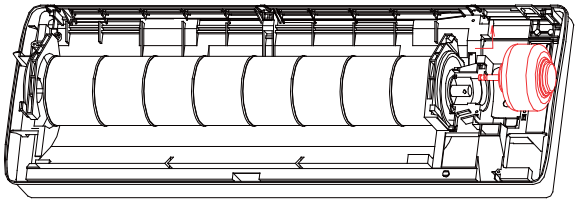
Step	Procedure	Points
1	Release the hooks	 
2	Release the hook from the back side. Lift up the lower part of the fixture plate and remove it.	 
6	Remove the heat exchanger	 

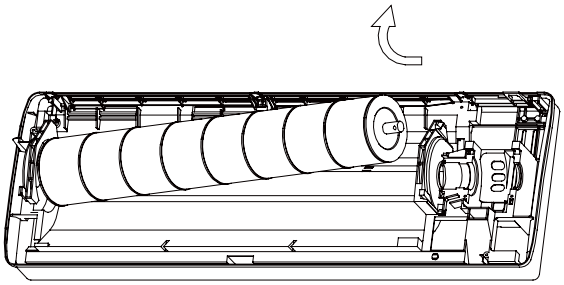
9.1.8 Removal of Fan Rotor and Fan Motor

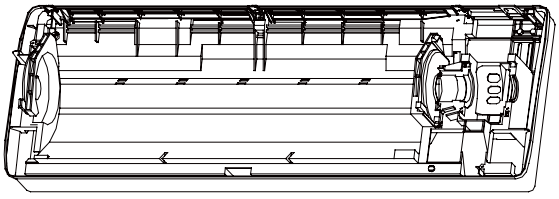
Step	Procedure	Points
1. Remove the right side plate.		
1	Loosen the 2 screws. 	
2	Remove the fixing plate.   	

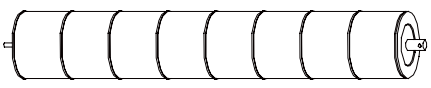
Step	Procedure	Points
3. Remove the fan.		
1	Loosen the marked screw.	
2	Lift up the right part of the fan motor and slide it to the rightward to remove.	
3	Lift up the right part of the fan and remove it	





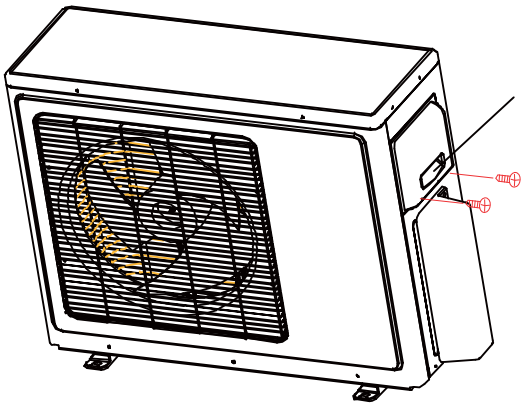
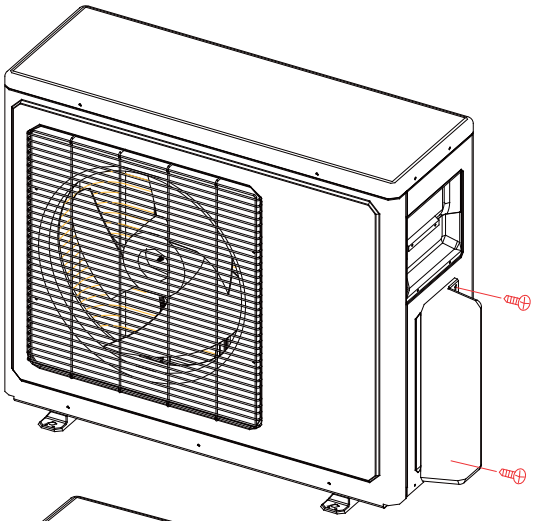
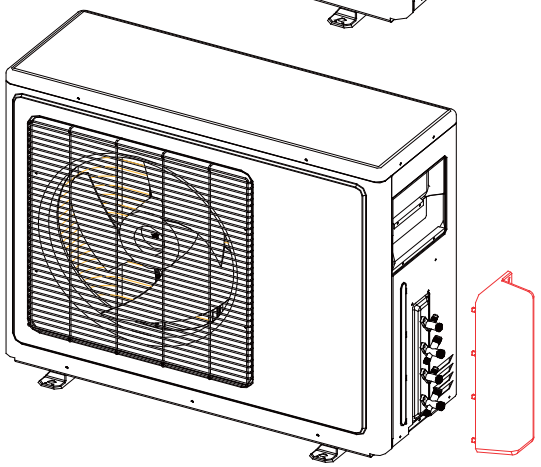




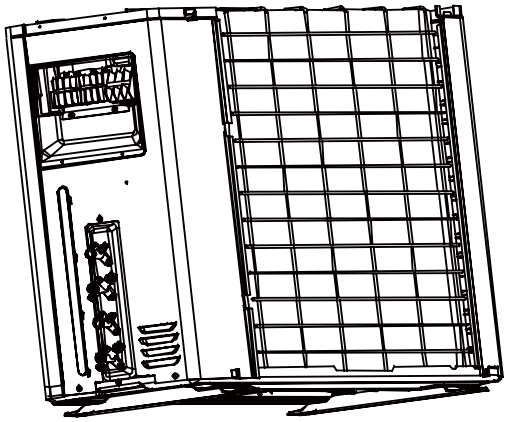


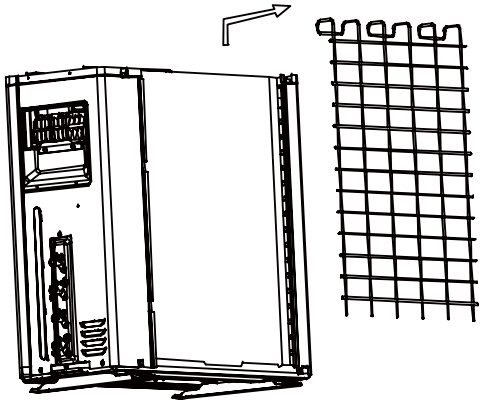
9.2 The removal procedure of Outdoor Unit

9.2.1 Removal of Outdoor panel

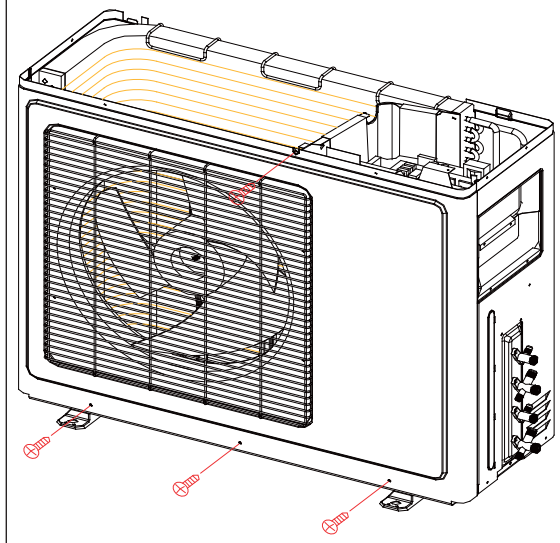
Step	Procedure	Points
1. Features		■ Be careful not to cut your finger by the fins of the heat exchanger.
1 Loosen the screw of the stop valve cover. Pull down the stop valve cover and remove it.	 	■ The stop valve cover is united with the shelter.

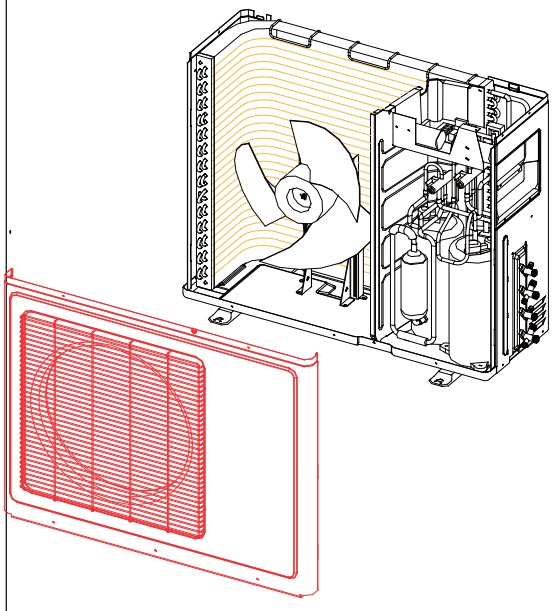
Step	Procedure	Points
3	remove the back guard	



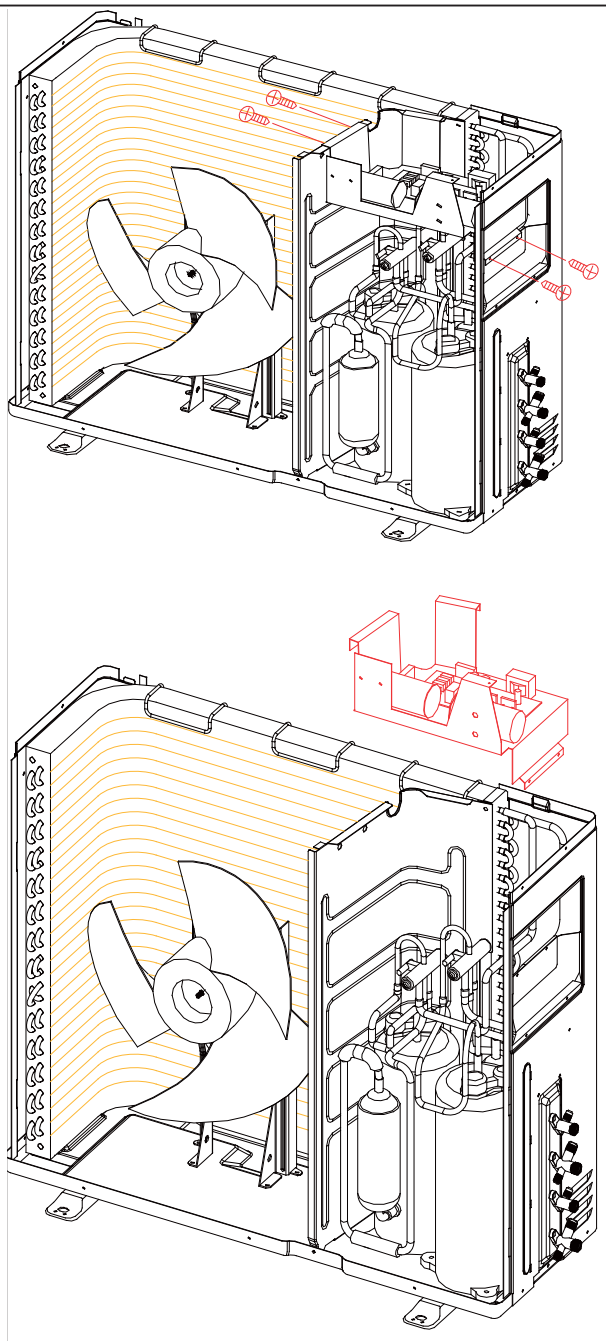


Step	Procedure	Points
4	Loosen the screws of the forntpanel. Pull and remove the front panel.	

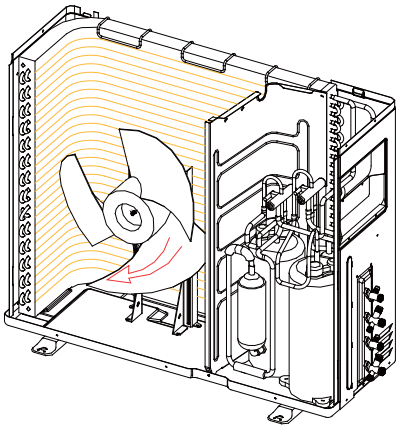
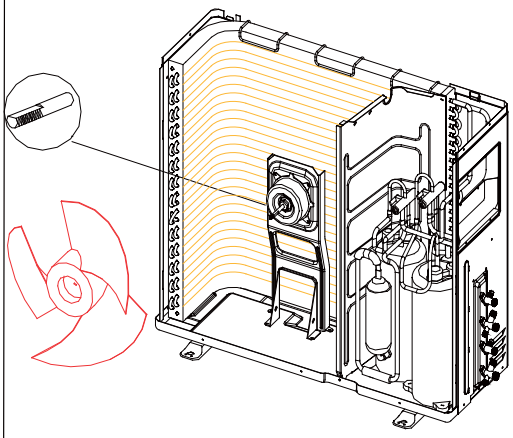
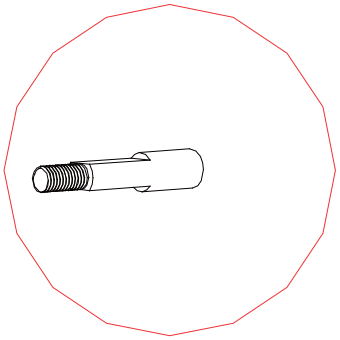




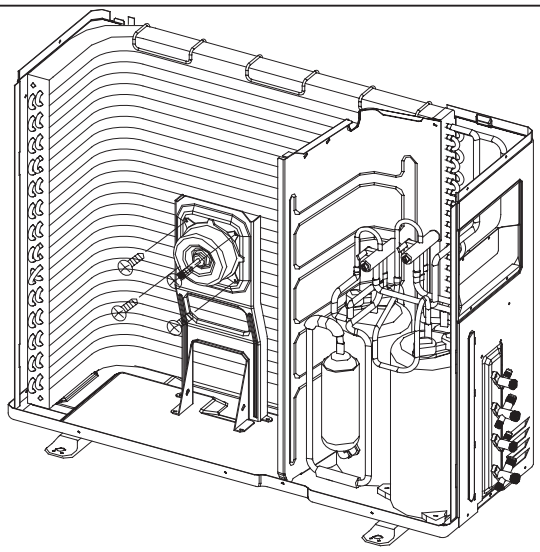
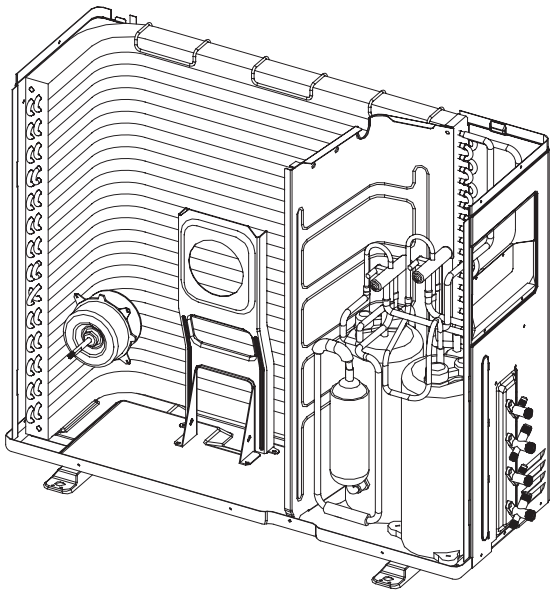
9.2.2 Romoval of Electrcal Box

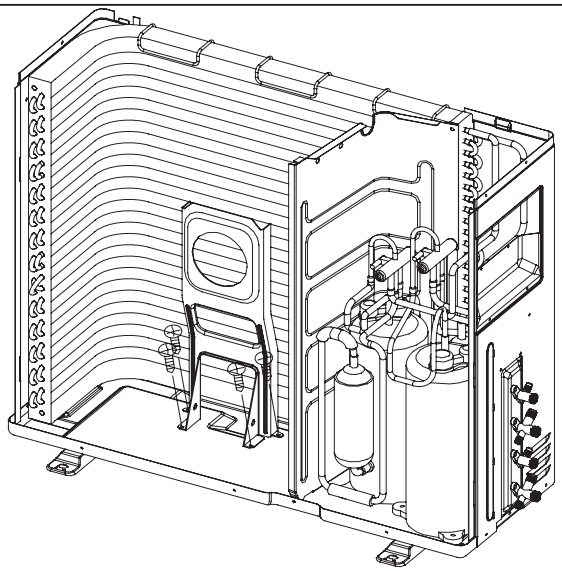
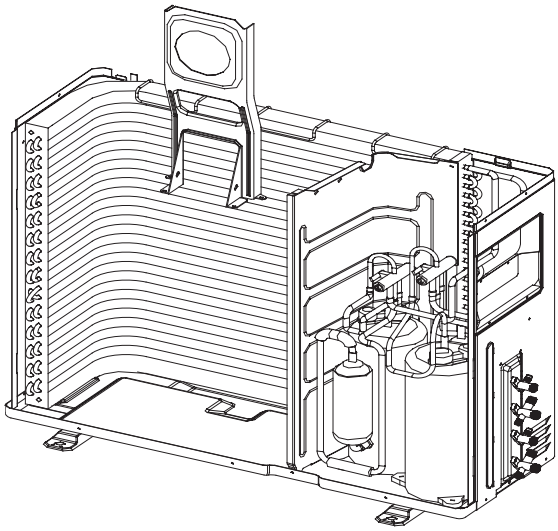
Step	Procedure		Points
	Remove the fixing screws, then lift the electrical box		

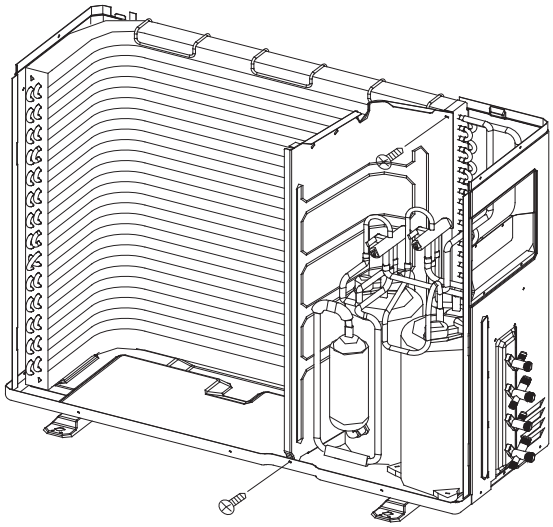
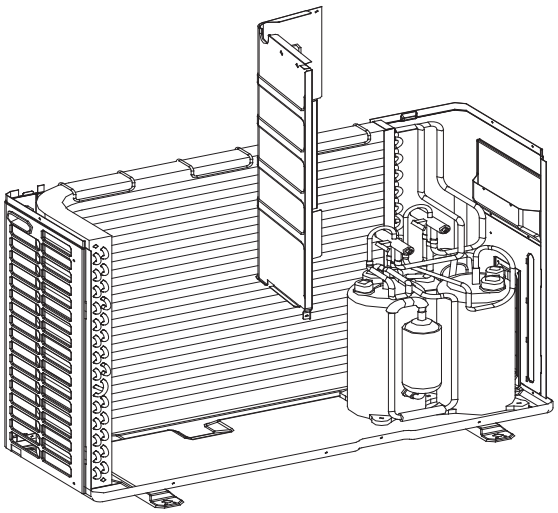
9.2.3 Romoval of Fan

Step		Procedure	Points
1	Loosen the fixing screw and remove the fan	 	 ■ Put the lead wire through the back of the motor when assembling. (so as not to be entangled with the propeller fan)

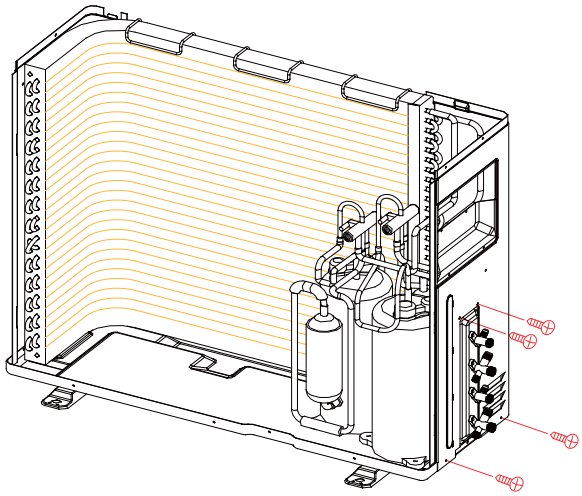
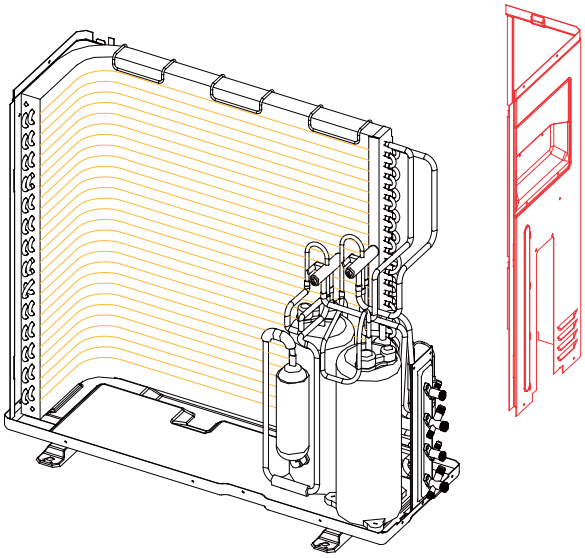
9.2.4 Romoval of fan motor, fan motor bracket and partition

Step	Procedure		Points
1	Remove the fixing screws, then remove the fan motor	 	

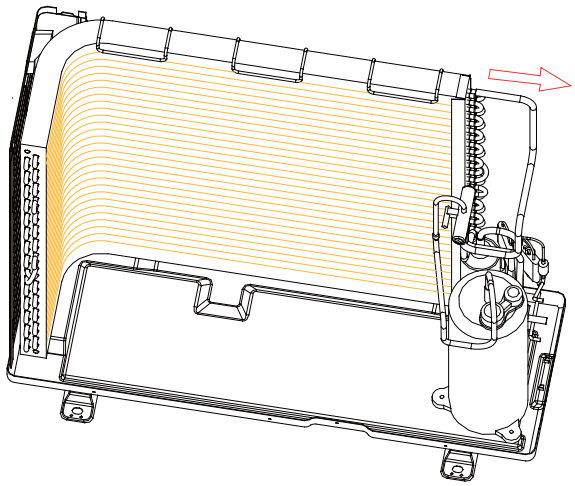
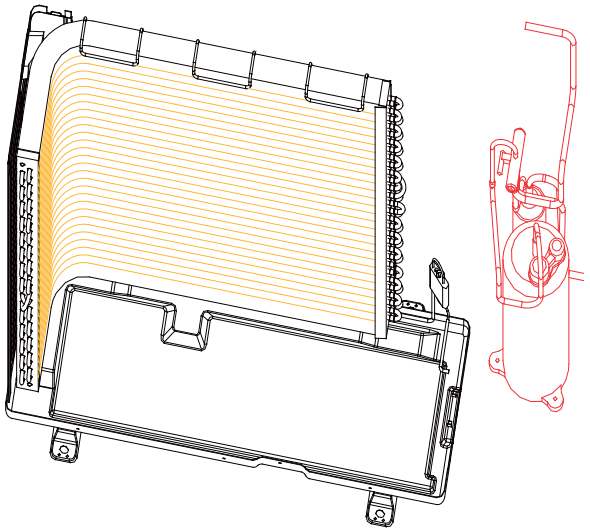
Step	Procedure		Points
2	Loosen the fixing screws and lift the fan motor bracket.	 	

Step	Procedure		Points
3	The partition plate has a hook on the lower side. Lift and pull the partition plate to remove.	 	■ When assembing, fit the lower hook into the bottom frame.

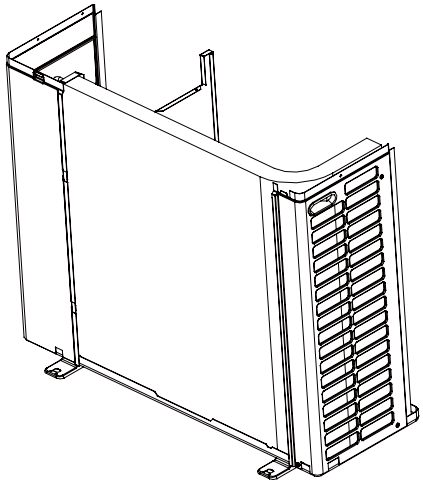
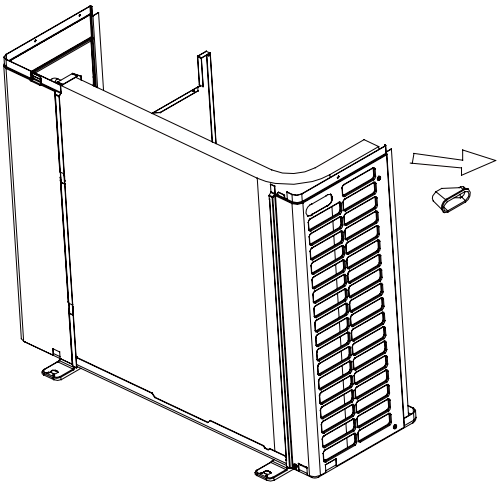
9.2.5 Romoval of right side plate

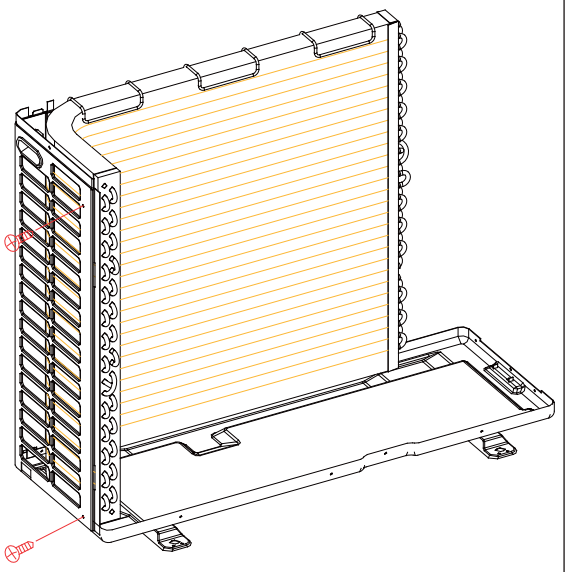
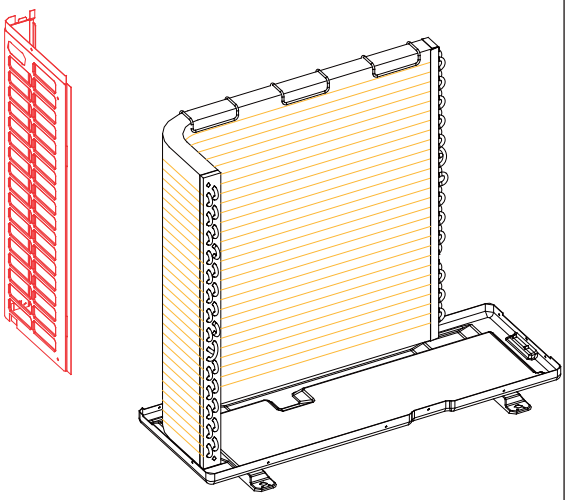
Step	Procedure		Points
1	Loosen the fixing screws and lift the left side plate	 	

9.2.6 Romoval of compressor

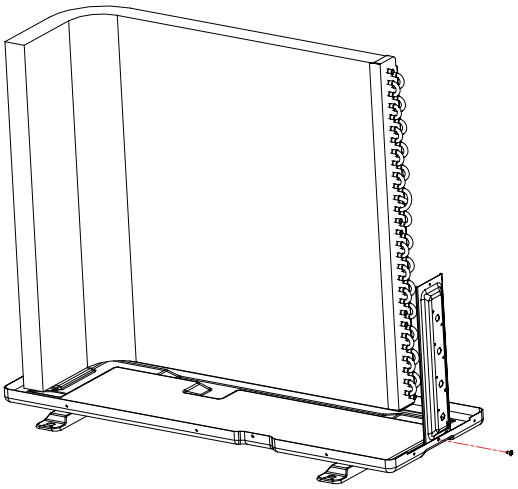
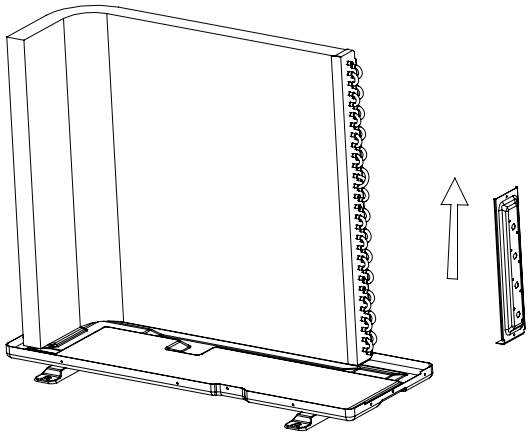
Step	Procedure		Points
1	Loosen the marked fixing screws		
2	Cut down the conecting pipe and pull out the compressor and remove the value bracket.		

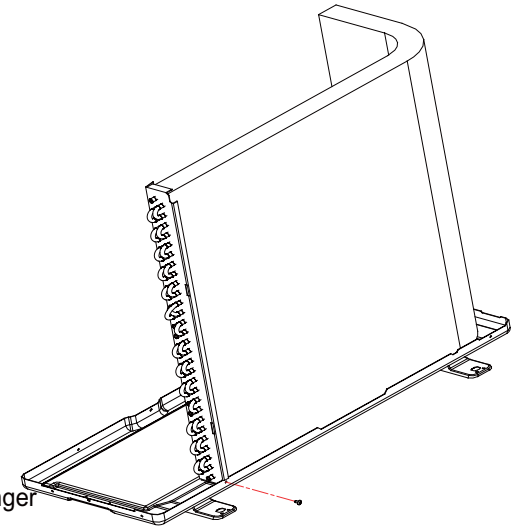
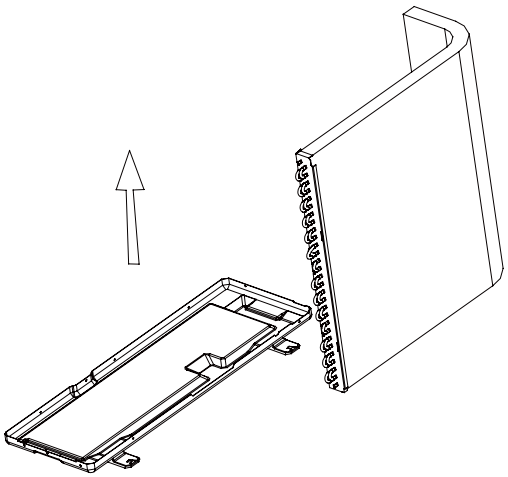
9.2.7 Romoval of right side plate

Step	Procedure		Points
1	Pull the Handlebar from the left side plate	 	

Step	Procedure	Points
2	Loosen the fixing screws and lift the left side plate  	

9.2.8 Romoval of heat exchanger

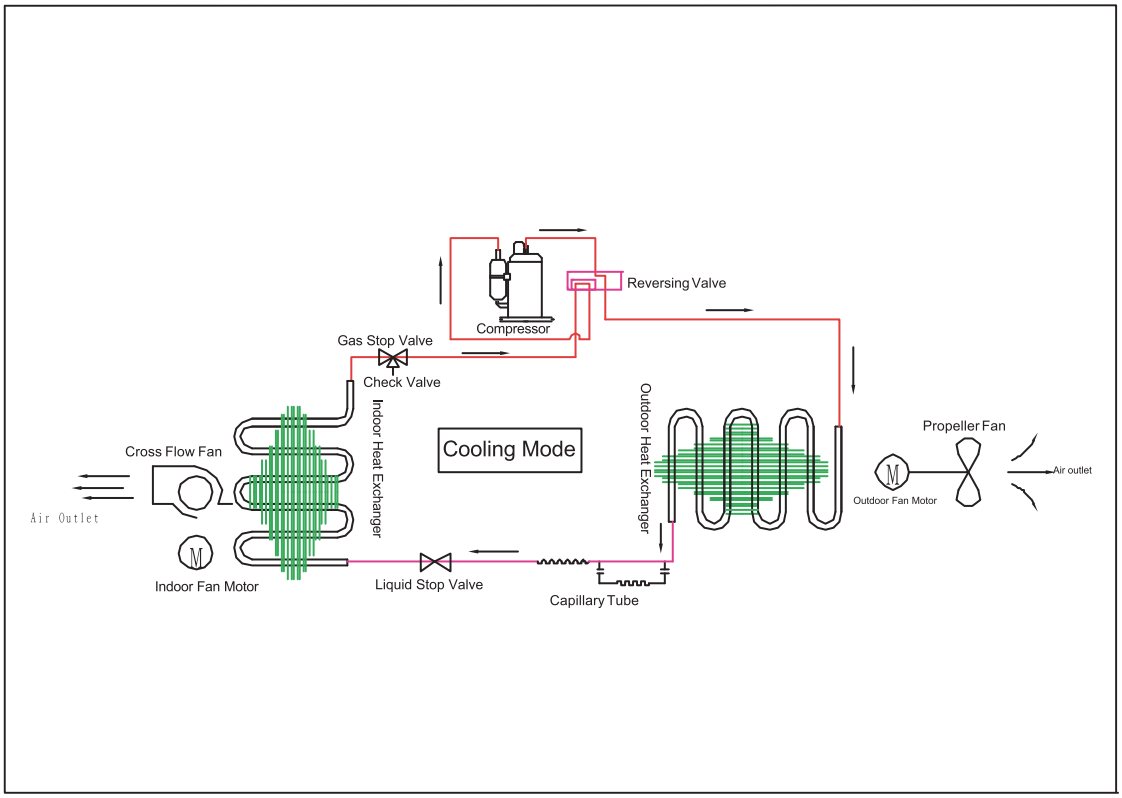
Step	Procedure	Points
5	Loosen the fixing screws and lift the Valve Base  	

Step	Procedure	Points
6	Loosen the fixing screws and lift the heater exchanger  	

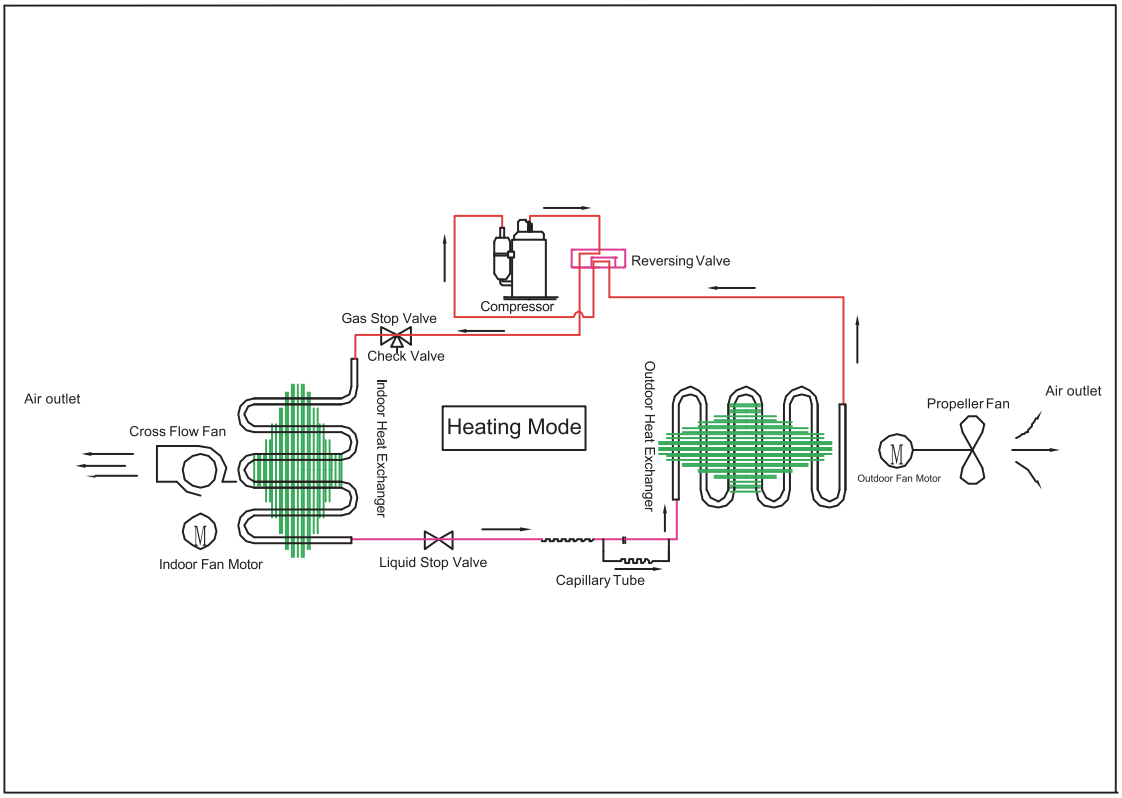
10. Appendix

10.1 Piping Diagrams

Cooling mode

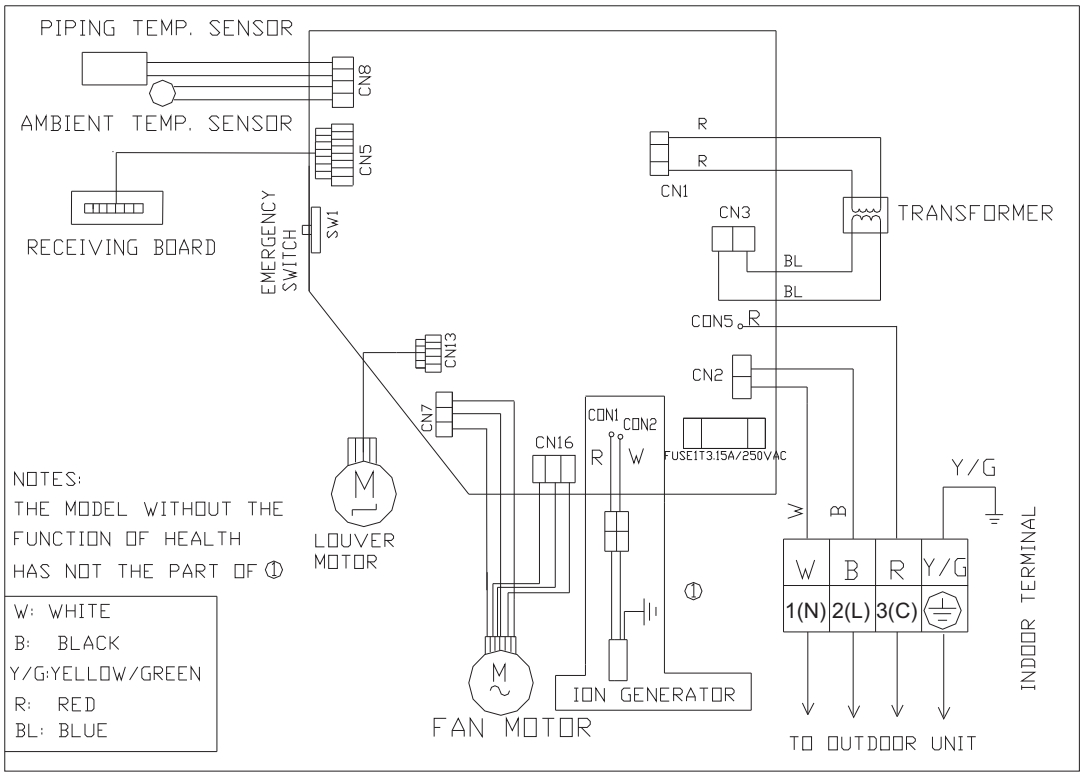


Heating mode

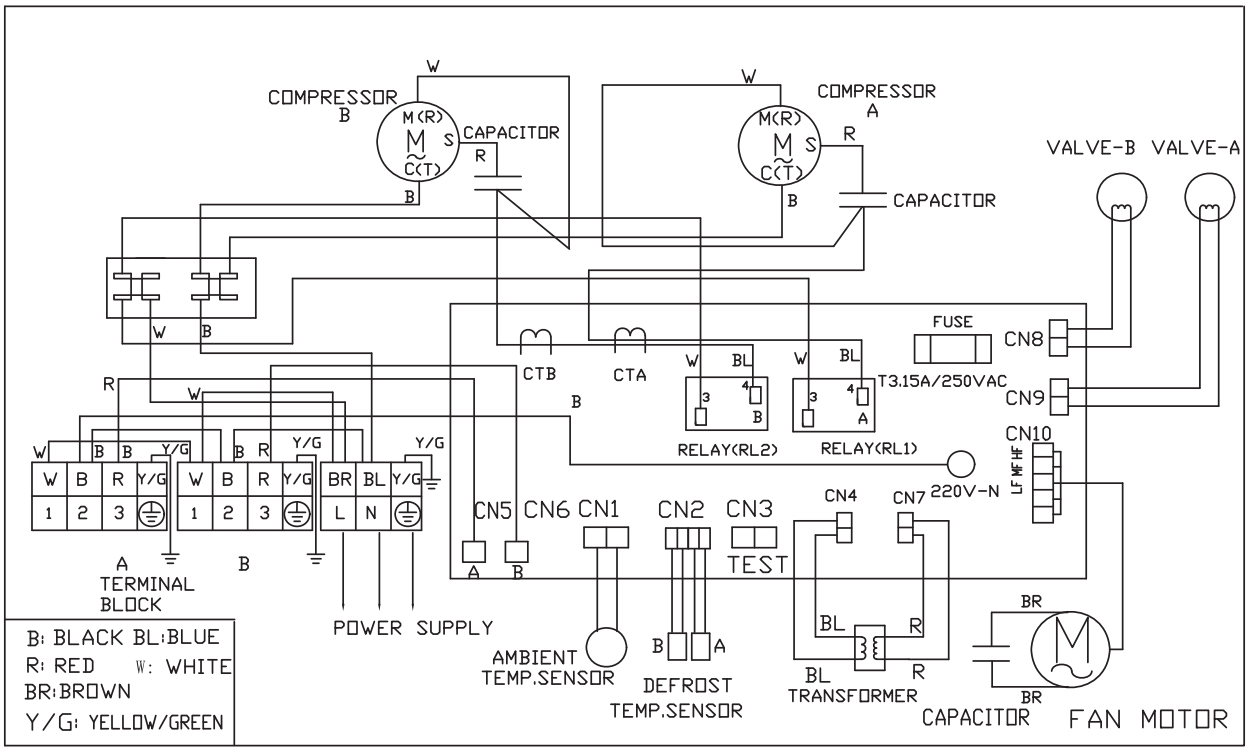


10.2 Wiring Diagrams

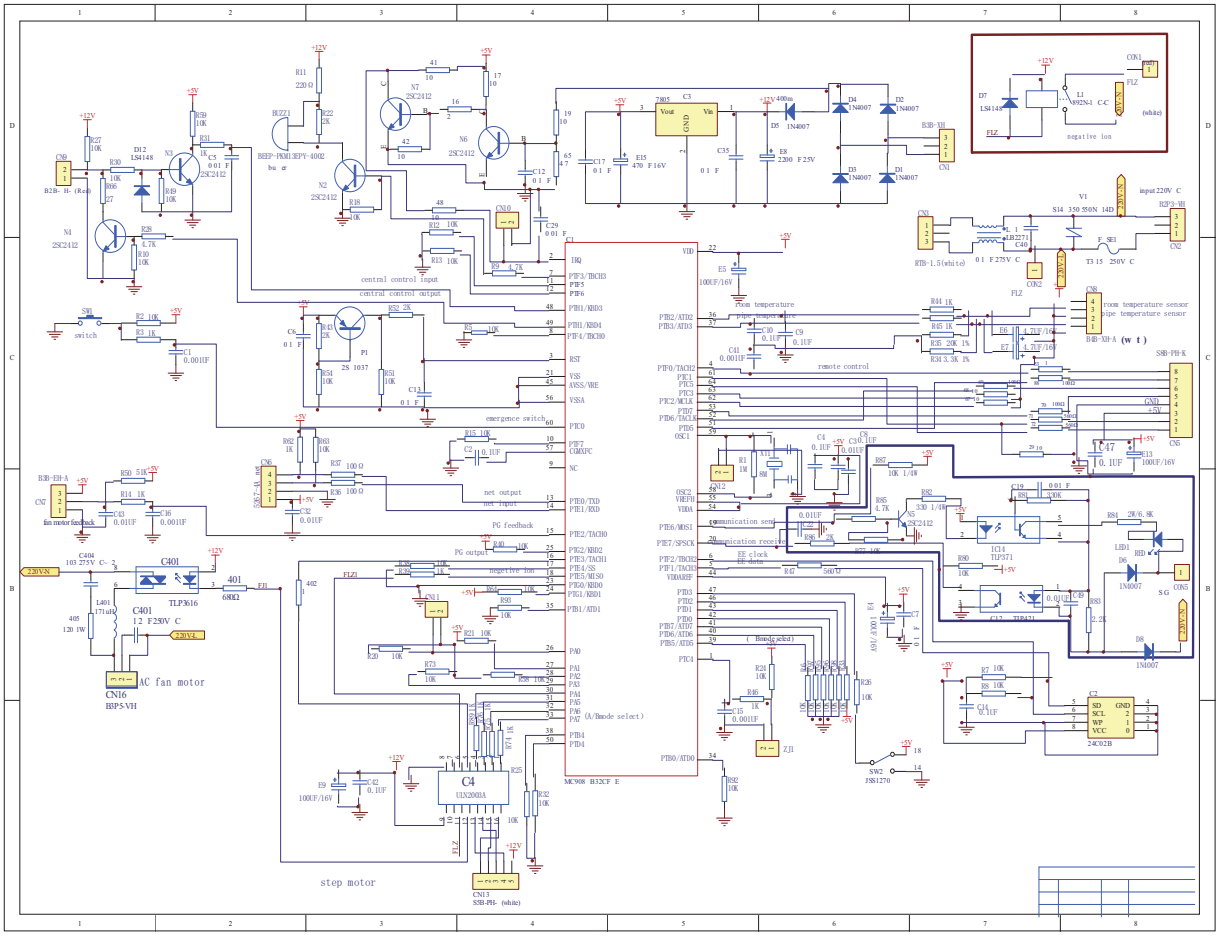
Indoor unit



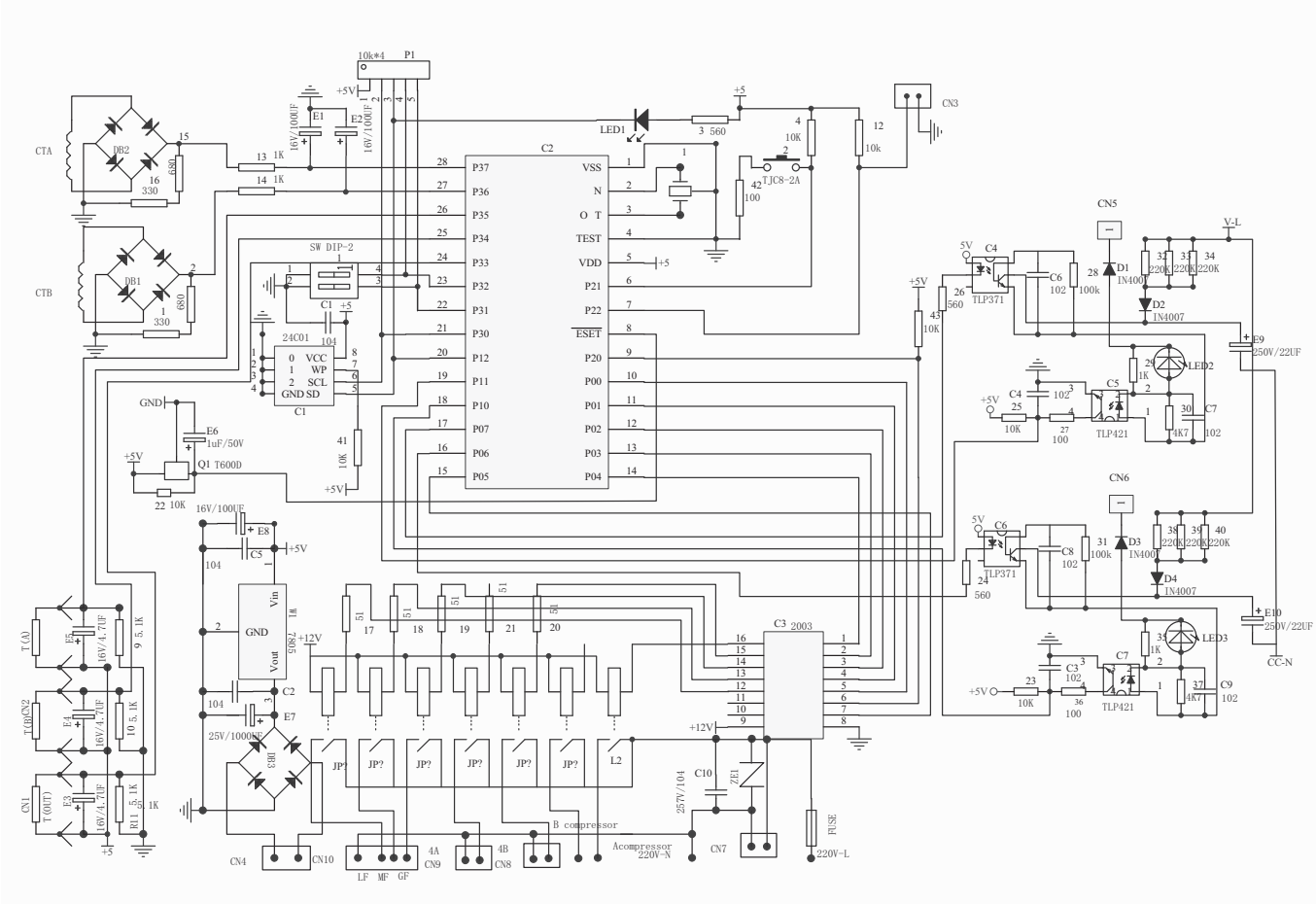
Outdoor unit



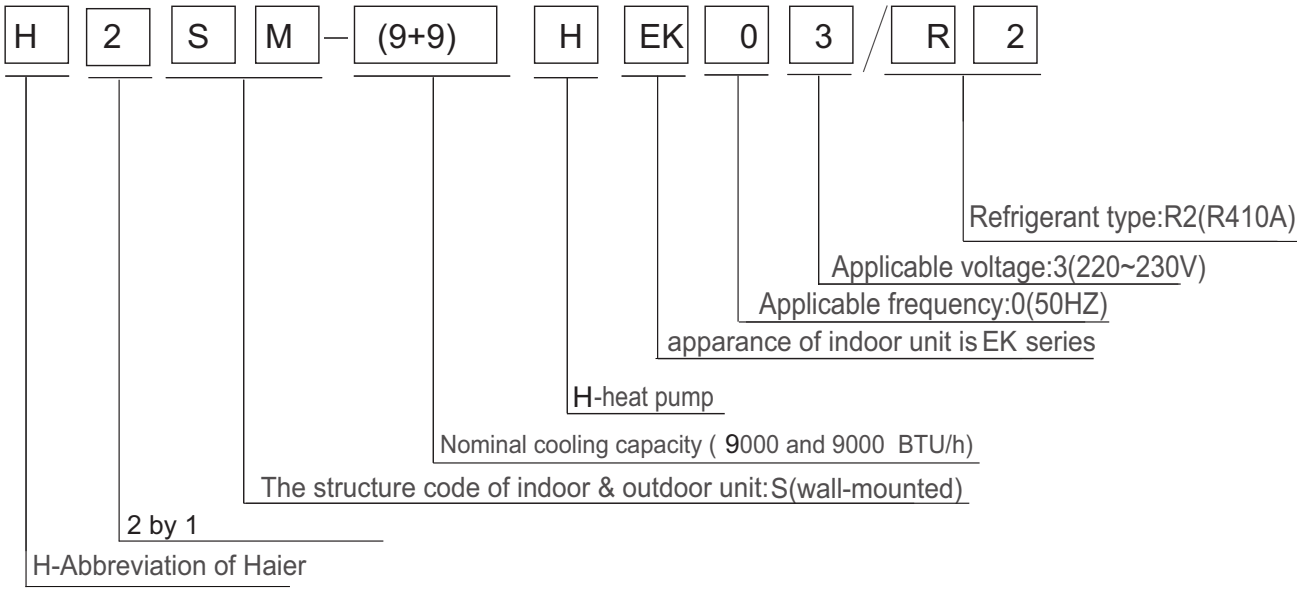
10.3 Circuit Diagrams



OUTDOORUNIT



10.4 Description of coding rules of the unit model


H 2 S M – (9+9) H EK 0 3 / R 2
Refrigerant type:R2(R410A)
Applicable voltage:3(220~230V)
Applicable frequency:0(50HZ)
apparance of indoor unit is EK series
H-heat pump
Nominal cooling capacity (9000 and 9000 BTU/h)
The structure code of indoor & outdoor unit: S(wall-mounted)
2 by 1
H-Abbreviation of Haier

Sincere Forever

Haier Group

Haier Industrial Park, No.1, Haier Road
266101, Qingdao, China
Email: hractech@haier.com
Tel: +86 532 87636960
http://www.haier.com

Edited by: Li Junjie
Li Qiyun
Signed by: Yang Bifei
Approved by: Wu Hongjin